

State: ASSAM

Agriculture Contingency Plan for District: NAGAON

1.0 District Agriculture Profile*			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Assam And Benagal Plain, Hot Sub humid To Humid (Inclusion Of Perhumid) Eco-Region (15.2)	
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)	
	Agro Climatic Zone (NARP)	CENTRAL BRAHMAPUTRA VALLEY ZONE (AS-3)	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Nagaon & Morigaon district	
	Geographic coordinates of district headquarters	Latitude	Longitude
		26°N	90°45'E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS Shilongani, Assam Agricultural University, District: Nagaon	
	Mention the KVK located in the district with full address	KVK, Nagaon, AAU, Shilongani, District - Nagaon Assam, PIN: 782 002	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RARS, Shilongani, Assam Agricultural University, District: Nagaon	

1.2	Rainfall	Normal RF (mm)	Normal Onset (Specify week and month)	Normal Cessation (Specify week and month)
	SW monsoon (June-Sep)	1231.0	1 st week of June	4 th week of September
	NE Monsoon (Oct-Dec)	139.6	2 nd week of October	2 nd Week of November
	Winter (Jan- February)	31.9	-	-
	Summer (March-May)	633.8	-	-
	Annual	2036.3	-	-

(Source: Regional Agricultural Research Station, Shilongani, Nagaon, Assam. Based on rainfall data from 1982 - 2010).

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	373.451	46.031	22.652	3.060	11.154	9.516	5.320	4.433	9.468	

1.4	Major Soils (common names like red sandy loam deep soils (etc..))*	Area ('000 ha)**	Percent (%) of total geographical area
	Sandy loam	NA	
	Clay loam	NA	
	Tila / red	NA	
	Clay	NA	
	Sandy	NA	

(data source: Soil Resource Maps of NBSS & LUP)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	217.805	192
	Area sown more than once	120.168	
	Gross cropped area	271.285	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	119.678		
	Gross irrigated area			
	Rainfed area	208.004		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			
	Tanks	303		
	Open wells			

Bore wels	23277		
Lift irriation schemes			
Micro-irriation			
Other sources (please specifY)	STW: 39071, Pond: 3224; LLP: 1564; Others: 5999		
Total Irriated Area			
Pump sets	25430		
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 hiqh levels of arsenic, fluoride, saline etc)
Over exploited	-	-	-
Critical	-	-	-
Semi- critical	-	-	-
Safe	-	-	-
Wastewater availability and use	-	-	-
Ground water qualitY			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%			

1.7 Area under major field crops & horticulture

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Grand total
		Rainfed	Irrigated	Total	Irrigated	Rainfed	Total		
Winter Rice	143.783		143.783					143.783	
Summer Rice							63.734	63.734	
Autumn Rice				32.879		32.879		32.879	
Rapeseed & Mustard					27.684	27.684		27.684	
Jute	8.213		8.213					8.213	
Wheat					7.133	7.133		7.133	
Sugarcane					6.092	6.092		6.092	
Pea					4.379	4.379		4.379	
Blackgram					2.841	2.841		2.841	
Lentil					1.733	1.733		1.733	
Greengram	0.740		0.740			0.740		0.740	
Sesame	0.659		0.659			0.659		0.659	

	Horticulture crops -	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Fruits			
	Banana	4.250		4.250
	Papaya	2.000		2.000
	Assam lemon	1.810		1.810
	Pine apple	1.900		1.900
	Mango	0.0053		0.0053
	Guava	0.188		0.188
	Horticulture crops -	Total	Irrigated	Rainfed
	Vegetables			
	Rabi vegetables	13.700		13.700
	Kharif vegetables	9.935		9.935
	Potato	6.350		6.350
	Ginger	1.629		1.629
	Turmeric	1.380		1.380
	Sweet potato	0.500		0.500
	Medicinal and	Total	Irrigated	Rainfed
	Aromatic crops			

Plantation crops	Total	Irrigated	Rainfed
Areca nut	5.825		5.825
Coconut	4.905		4.905
Eg., industrial pulpwood crops etc.			
Fodder crops	Total	Irrigated	Rainfed

1.8	Livestock		Male ('000)	Female ('000)	Total ('000)	
	Indigenous cattle	-	-	-	802	
	Improved / Crossbred cattle	-	-	-	56	
	Buffaloes (local low yielding)	-	-	-	12	
	Improved Buffaloes	-	-	-		
	Goat	-	-	-	356	
	Sheep	-	-	-	12	
1.9	Pig	-	-	-	Local: 58, Cross breed: 16	
	Mithun-	-	-	-	-	
	Yak	-	-	-	-	
	Others (Horse, mule, donkey etc., specify)	-	-	-		
	Commercial dairy farms (Number)				8	
1.10	Fisheries (Data source: Chief Planning Officer)					
	A. Capture					
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets	
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

ii) Inland (Data Source: Fisheries Department)	No. Farmer owned Ponds	No. of Reservoirs	No. of village tanks

B. Culture

	Water Spread	Area (ha)	Yield (t/ha)	Production ('000 tons)
i) Brackish water (Data Source: MPEDA/ Fisheries Department)				
i) Fresh water (Data Source: Fisheries Department) 2008-09		420	5.329	22,599
Ponds & Tanks				
Beels				
Rivers				
Swamp/ low-lying area				
Paddy fields		306	-	1.061
Others		251	-	1.486

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08; specific years) 2007-08

1.11	Name of crop	Kharif		Rabi		Summer		Total Production ('000 t)	Total Productivity (kg/ha)	Crop residue as fodder ('000 tons)
		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)										
	Summer Paddy			-		219	3447	219	3447	
	Winter Paddy	329	2400	-				329	2400	
	Autumn Paddy	-		-		65	1984	65	1984	

Rapeseed & Mustard	-		18.41	6.65			18.41	6.65	
Wheat	-		7.019	984			7.019	984	
Black gram	-		13,10	528	2.10	544	15.20	535	
Sugarcane	-				218.75	35794	218.75	35794	
Major Horticultural crops (Crops to be identified based on total acreage)									
Banana							63750	15000	
Papaya							64000	32000	
Assam lemon							29865	16500	
Pineapple							26220	13800	
Coconut							30901	6300	
Areca nut							92035	15800	
Rabi vegetables							114252	115	
Kharif vegetables							294550	215	

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Sali Paddy	Summer rice (Early Ahu)	Mustard	Jute	Wheat
	Kharif- Rainfed	June - July			March- April	
	Kharif-Irrigated	-	-	-	-	-
	Rabi- Rainfed			October-November		
	Rabi-Irrigated					November- December

	Summer-irrigated		Dec- Feb		
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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)			
	Crop	Severe	Moderate	Mild
	Winter Rice	Stem borer, Case worm, Leaf folder, Gandhi bug, Rodent, Blast, Sheath rot, Brown spot	Hispa, Gall midge, , BLB, Bakane, , Root knot nematode	BPH, GPH, False smut
	Autumn Rice (Early ahua and Normal ahua)	Stem borer, Case worm, Leaf folder, Gandhi bug, Blast, Sheath rot, Brown spot, Root knot nematode	Hispa, Gall midge, , BLB, Bakane, Rodent,	BPH, GPH, False smut
	Rapeseed & Mustard	Aphid, Saw fly		
	Wheat	Loose smut	Rodent	
	Black gram	YMV	Aphid Jassids	Flea Leaf Beetle, Pod Borer , Pod Bug
	Jute	Fungal wilt, Stem rot, Semilooper	Caterpiller	

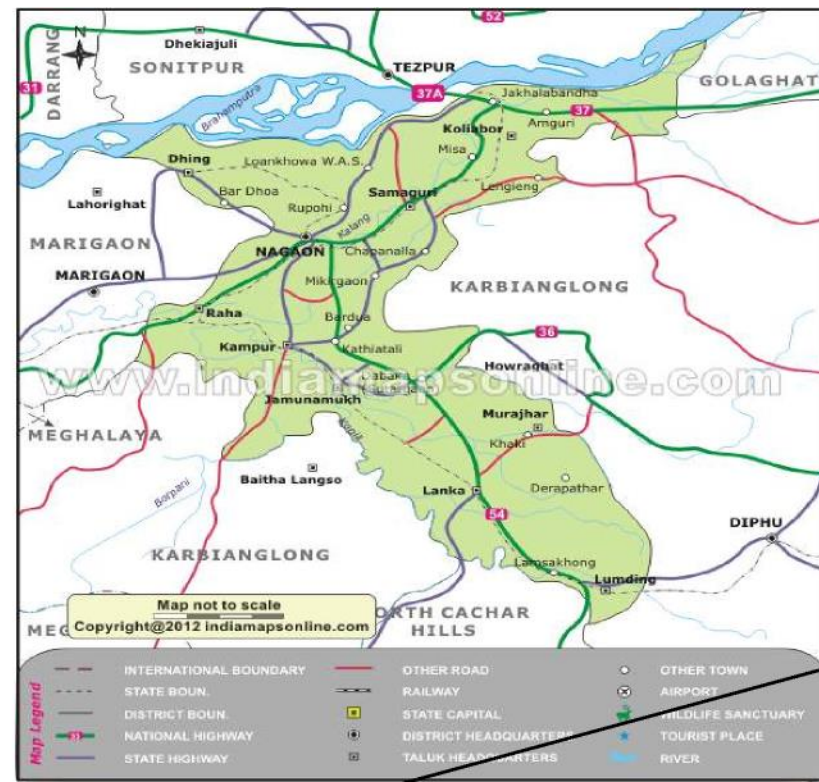
Banana	Panama wilt	Cercospora leaf spot	
Areca nut and coconut	Ganoderma wilt, White grub		
Jack fruit	Fruit rot		
Vegetables	Bacterial wilt, Fungal wilt, Damping off, Late blight in potato, anthracnose in chili, White grub, Fruit and shoot borer, TLCV	Colar rot, blight,	

*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 1	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: No (NA)

Annexure – 1: LOCATION MAP OF NAGAON DISTRICT ASSAM

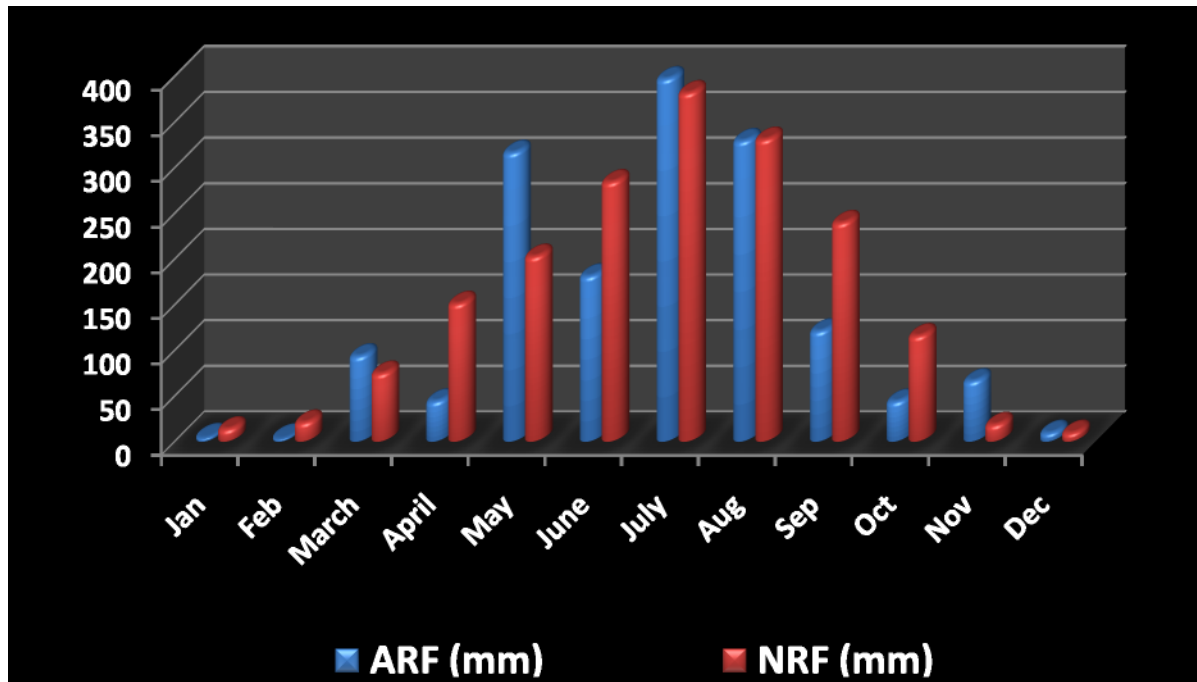
(Source: mapsindia.com)



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Annexure – 2: MEAN ANNUAL RAINFALL

(Actual rainfall during 2011 & Normal Rainfall (mm))



2.0 Strategies for weather related contingencies 2.1

Drought

2.1.1 Rainfed situation

Condition	Major Farming situation ^a	Suggested Contingency measures			Remarks on Implementation ^e
		Crop/ cropping system ^b	Change in crop/ cropping system ^c	Agronomic measures ^d	
Early season drought (delayed onset)					
Delay by 2 weeks (Specify month)* Month: 3 rd week of June	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Recommended package of practices for normal sowing.	-
		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change	Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change	Recommended package of practices for normal sowing.	-
	Rainfed medium / medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No Change	Recommended package of practices for normal sowing.	-
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili	No Change	Recommended package of practices for normal sowing.	-
		Rice (kharif) – Rice (summer)	No Change	Recommended package of practices for normal sowing.	-
	Flood prone (sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi	No Change	Recommended package of practices for normal sowing.	-

		vegetables/Chili			
		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change Sali Paddy- For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse rain varieties with up to 60 days old seedlings	Growin ^g of submer ^g ence tolerant varieties such as Jalashree, Jalkuwari which can tolerate 12-15 da ^y s submer ^g ence (transplantin ^g within Jul ^y). Seedlin ^g s should be raised in non flood prone or hi ^g h land area. If flood water recedes early and transplantin ^g can be done by mid Au ^g ust, select varieties like Satyaranjan, Basundhara, IR -36, Ja ^y a etc. Seedlin ^g s should be raised in non flood prone or hi ^g h land area. - If transplantin ^g is possible durin ^g last part of Au ^g ust, short duration varieties such as Luit, Kolon ^g , Dishan ^g etc. can also be selected (transplantin ^g up to last part of Au ^g ust). 20-25 da ^y s old seedlin ^g should be transplanted at 20x1 5 cm spacin ^g with 4-5 seedlin ^g s/hil. - For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse rain varieties with up to 60 days old seedlin ^g s can be s ^r own up to last part of Au ^g ust. About 10 kg seed/ha is required with closer spacin ^g (20 cm x 20 cm) and 6-8 seedlin ^g s/hil. Community nursery may be raised in non- flood prone or hi ^g h land for	Technolo ^g y showcasin ^g pro ^g ramme of AAU and other seed production pro ^g rammes of state dept of a ^g riculture, Assam

raising of rice seedlings.
- Select delayed planting varieties like Prafula and Gitesh with up to 60 days old seedlings (Sowing in the nursery bed within June). Seedlings should be raised in non flood prone or high land area.

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation ^a	Crop/ cropping system ^b	Change in crop/ cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 4 weeks (Specify month)* 1 st week of July	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Recommended package of practices for normal sowing.	-
		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change	Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change	Recommended package of practices for normal sowing.	-
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	If transplanting is possible within July, HYVs like Ranjit, Bahadur, Mahsuri, Piolee, Kushal, Moniram etc can be selected. Growing of medium duration rice varieties such as Satyaranjan, Basundhara, IR-36, Jaya etc (transplanting up to mid August). Short duration varieties such as Luit,	Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam

				<p>Kolon^g, Dishan^g etc. can also be selected (transplantin^g up to last part of Au^gust). 20-25 days old seedlin^g should be transplanted at 20x1 5 cm spacin^g with 4-5 seedlin^gs/hil.</p> <p>Varieties such as Pankaj, Kushal, Lakhimi can be ^grown up to Au^gust 15 with 45 -50 da^ys old seedlin^gs.</p> <p>Varieties that can be ^grown as late Sali up to last part of Au^gust are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse ^grain varieties with up to 60 days old seedlin^gs. About 10 kg seed/ha is required with closer spacin^g (20 cm x 20 cm) and 6-8 seedlin^gs/hil.</p>	
		<p>Jute / Rice(Kharif)- Torja / Lentil/ Wheat / Potato / Rabi ve^getables/Chili</p>	<p>No chan^ge</p> <p>Rice(Kharif)- -Manohar Sali, Andrew Sali, Salpona</p>	<p>Growin^g of medium duration rice varieties such as Sat^yaranjan, Basundhara. IR-36. Ja^ya etc (transplantin^g up to mid Au^gust).</p> <p>Short duration varieties such as Luit, Kolon^g, Dishan^g etc. can also be selected (transplantin^g up to last part of Au^gust). 20-25 da^ys old seedlin^g should be transplanted at 20x1 5 cm spacin^g with 4-5 seedlin^gs/hil.</p> <p>Varieties such as Pankaj, Kushal, Lakhimi can be ^grown up to Au^gust 15 with 45 -50 da^ys old seedlin^gs.</p> <p>Varieties that can be ^grown as late Sali up to last part of Au^gust are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse ^grain varieties with up to 60 days old seedlin^gs. About 10 kg seed/ha is required with closer</p>	<p>Technolo^gy showcasin^g programme of AAU and other seed production programmes of state dept of a^griculture, Assam</p>

				spacing (20 cm x 20 cm) and 6-8 seedlings/hil.	
		Rice (kharif) – Rice (summer)	No change	<p>Growing of medium duration rice varieties such as Satyaranjan, Basundhara, IR-36, Jaba etc (transplanting up to mid August). Short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil.</p> <p>Varieties such as Pankaj, Kushal, Lakhimi can be grown up to August 15 with 45 -50 days old seedlings. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil.</p>	Technology showcase programme of AAU and other seed production programmes of state dept of agriculture, Assam
	Flood prone (Sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/Wheat/Potato/Rabi	No Change	Recommended package of practices for normal sowing.	-

		vegetables/Chili			
		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	<p>If flood water recedes early and transplanting can be done by mid August, select varieties like Sat'aranjan, Basundhara, IR -36, Ja'ya etc. Seedlings should be raised in non flood prone or high land area. If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. For chronicaly flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings can be grown up to last part of August. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil. Community nursery may be raised in non- flood prone or high land for raising of rice seedlings.</p> <p>If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichan etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be</p>	<p>Technology showcase programme of AAU and other seed production programmes of state dept of agriculture, Assam</p>

broadcast in puddle field.

Condition	Major Farming situation ^a	Suggested contingency measures			
		Crop/ cropping system ^b	Change in crop/ cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset)					
Delay by 6 weeks 3 rd week of July	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Recommended package of practices for normal sowing.	-
		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change	Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change	Recommended package of practices for normal sowing.	-
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolong, Dishan etc.	Short duration varieties can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil.s	Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam

		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili	Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolon ^g , Dishan ^g etc.	Short duration varieties such as Luit, Kolon ^g , Dishan ^g etc. can also be selected (transplanting up to last part of August). 20-25 days old seedlings should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil.	Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam
		Rice (kharif) – Rice (summer)	Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolon ^g , Dishan ^g etc.	Short duration varieties such as Luit, Kolon ^g , Dishan ^g etc. can also be selected (transplanting up to last part of August). 20-25 days old seedlings should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil.	Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam
	Flood prone (Sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	Recommended package of practices for normal sowing.	-
		Late Sali (Kharif) – Toria/Lentil/	No Change	If transplanting is possible during last part of August, short duration	Technology showcasing

		<p>Wheat/Potato/Rabi vegetables/Chili</p>		<p>varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedlings should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. For chronicallY flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse rain varieties with up to 60 days old seedlings can be grown up to last part of August. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil. Community nursery may be raised in non- flood prone or high land for raising of rice seedlings. If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichan etc or any traditional photo period sensitive coarse rain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	<p>programme of AAU and other seed production programmes of state dept of agriculture, Assam</p>
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Condition	Major Farming situation ^a	Suggested Contingency measures			
		Crop/ cropping system ^b	Change in crop/ cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset)					
Delay by 8 weeks (Specify month)* 1 st week of august	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Recommended package of practices for normal sowing.	-
		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change	Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change	Recommended package of practices for normal sowing.	-
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolong, Dishan etc.	Short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil. Direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichan etc or any traditional	-Technology showcase programme of AAU and other seed production programmes of state dept of agriculture, Assam

				<p>photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	
		<p>Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili</p>	<p>Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolong, Dishan etc.</p>	<p>Short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil. Direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichan etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	<p>Technology showcase programme of AAU and other seed production programmes of state dept of agriculture, Assam</p>
		<p>Rice (kharif) – Rice (summer)</p>	<p>Rice(Kharif) monocropping-- Short duration varieties such as Luit, Kolong, Dishan etc.</p>	<p>Short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing</p>	<p>Technology showcase programme of AAU and other seed production programmes of state</p>

				<p>with 4-5 seedlings/hil. Varieties that can be grown as late Sali up to last part of August are Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain varieties with up to 60 days old seedlings. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil Direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichang etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	dept of agriculture, Assam
Flood prone (Sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/Wheat/Potato/Rabi vegetables/Chili	No Change	Recommended package of practices for normal sowing.	-	
	Late Sali (Kharif) – Toria/Lentil/Wheat/Potato/Rabi vegetables/Chili	No Change	<p>If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil. For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain</p>	<p>Technology showcase programme of AAU and other seed production programmes of state dept of agriculture, Assam</p>	

				<p>varieties with up to 60 days old seedlings can be grown up to last part of August. About 10 kg seed/ha is required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hil. Community nursery may be raised in non- flood prone or high land for raising of rice seedlings.</p> <p>If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichang etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	
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Condition	Major Farming situation ^a	Suggested Contingency measures			
		Crop/ cropping system ^b	Change in crop/ cropping system ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Life saving supplemental irrigation -Weeding at critical stages of growth.	Development of water harvesting structure under NREGS Arrangements of pump sets under NFSM and RKVY

germination/ crop stand etc.		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change	Life saving supplemental irrigation -Weeding at critical stages of growth.	Development of water harvesting structure under NREGS Arrangements of pump sets under NFSM and RKVY
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change	Life saving supplemental irrigation Weeding at critical stages of growth.	Development of water harvesting structure under NREGS Arrangements of pump sets under NFSM and RKVY
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	Supplemental irrigation in the nursery bed of rice. The gap of 30 cm between two beds may be converted into channel to supply water to keep the raised beds moist in the event of drought occurs. Application of sufficient quantity of FYM or compost in the nursery bed and main field. Where germination is severely affected, re-sowing of rice seed may also be recommended. Varieties suitable for normal sowing should be selected. Spraying of Mancozeb @ 2.5g/l or Edinophos 2 1ml/l or Carbendazim @ 1 g/l against brown spot disease in rice.	Development of water harvesting structure under NREGS Arrangements of pump sets under NFSM and RKVY
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili	No change		
Rice (kharif) – Rice (summer)	No change				
	Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	Supplementary life saving irrigation at critical crop stages	Development of water harvesting structure under NREGS

		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	In chronically flood affected areas, where rice nursery is raised in upland/ non flood prone areas to grow recommended rice varieties as late sali with higher seedling age, re-sowing of rice seed may also be recommended where germination is severely affected. Seed treatment with 4% MOP (600ml/kg of seed) for 24 hrs, dry it in shade for 24 hrs and sowing -Supplemental irrigation in the nursery bed of rice. The gap of 30 cm between two beds of rice nursery may be converted into channel to supply water to keep the raised beds moist in the event of drought occurs. Application of sufficient quantity of FYM or compost in the nursery bed and main field.	Technology showcasing programme/ seed production programme of AAU and National Food Security Mission (NFSM) as source of seed -Development of water harvesting structure under NREGS
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Condition	Major Farming situation ^a	Suggested Contingency measures			
		Crop/ cropping system ^b	Change in crop/ cropping system ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (> 2.5 mm) period)					

At vegetative stage	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Life saving supplemental irrigation Weeding at critical stages of growth. Thinning to maintain optimum plant population. Mulching in horticultural crops	Development of water harvesting structure under NREGS for life saving irrigation
		Rice (DS) / summer vegetables - Black gram/Sesame	No Change		
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change		
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice Spraying of 2% KCL solution on leaves of rice if and when drought appears. Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage. Life saving supplemental irrigation at critical stages of crop growth Spraying of Mancozeb @ 2.5g/l or Edinophos 2 1ml/l or Carbendazim @ 1g/l against brown spot disease in rice. Weeding at critical stages of growth.	Development of water harvesting structure under NREGS for life saving irrigation Arrangements of pump sets under NFSM and RKVY
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili	No change		
		Rice (kharif) – Rice (summer)	No change		
	Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	Supplementary life saving irrigation at critical crop stages	Development of water harvesting structure under NREGS for life saving irrigation Arrangements of

					pump sets under NFSM and RKVY
		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	Supplementary life saving irrigation at critical crop stages Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice Spraying of 2% KCL solution on leaves of rice if and when drought appears. Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing	Development of water harvesting structure under NREGS for life saving irrigation Arrangements of pump sets under NFSM and RKVY

Condition	Major Farming situation ^a	Suggested Contingency measures			
		Crop/ cropping system ^b	cropping system ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Mid season drought (long dry spell)					
At reproductive stage	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	No Change	Life saving supplemental irrigation Weeding at critical stages of growth. Mulching with crop residue in horticultural crops	Development of water harvesting structure under NREGS for life saving irrigation Arrangements of pump sets under NFSM and RKVY
		Rice (DS) / summer vegetables - Black gram/Sesamum	No Change		
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	No Change		
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice before flowering. Spraying of 2% KCL solution on leaves of rice if and when drought appear before flowering. Top dressing of urea may be delayed up to heading stage of rice if drought prevails at the stages of top dressing Life saving supplemental irrigation at critical stages of crop growth If crop fails, plan for rabi vegetables, oilseeds, pulses etc.	Development of water harvesting structure under NREGS for life saving irrigation Arrangements of pump sets under NFSM and RKVY
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili	No change		
		Rice (kharif) – Rice (summer)	No change		
	Flood prone	Summer vegetables/Jute – Toria/Lentil/	No Change		

		Wheat/Potato/Rabi vegetables/Chili			
		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	No Change	Supplementary life saving irrigation at critical crop stages Top dressing of additional quantities of MOP @ 37.5 kg/ha and incorporation is recommended in rice Spraying of 2% KCL solution on leaves of rice if and when drought appears. Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing If crop fails, plan for rabi vegetables, oilseeds, pulses etc.	Development of water harvesting structure under NREGS

Condition	Major Farming situation	Suggested Contingency measures			
		Crop/ cropping system	Crop management	Rabi crop planning	Remarks on Implementation
Terminal drought	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chili	-	Rabi cropping with cole crops such as Cauliflower (mid season varieties – Improved Japanese, Pusa Synthetic, Pusa snowball etc.) and Cabbage (Varieties – Golden acre, Pride of India, Pusa Mukta etc.), Knolkhol (White vena) etc. Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices.	Development of water harvesting structure under NREGS for life saving irrigation
		Rice (DS) / summer vegetables - Black gram/Sesamum	-Life saving supplemental irrigation -Harvesting of kharif crops at physiological maturity stage.	Growing of rabi field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and	Arrangements of pump sets under NFSM and RKVY Arrangement of seed under National Horticultural Mission

		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chili	-	package of practices.	
Rainfed medium /medium lowland (Sandy loam to clay loam)		Rice(Kharif) monocropping	Life saving supplemental - irrigation Harvesting of kharif crops at physiological maturity stage.	Rabi cropping with cole crops such as Cauliflower (mid season varieties – Improved Japanese, Pusa Synthetic, Pusa snowball etc.) and Cabbage (Varieties – Golden acre, Pride of India, Pusa Mukta etc.), Knolkhol (White vena) etc.	Development of water harvesting structure under NREGS for life saving irrigation
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chili		Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices.	Arrangement of seed under National Horticultural Mission
		Rice (kharif) – Rice (summer)		Growing of rabi field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	
Flood prone		Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili	Life saving supplemental irrigation Harvesting of kharif crops at physiological maturity stage.	Rabi cropping with cole crops such as Cauliflower (mid season varieties – Improved Japanese, Pusa Synthetic, Pusa snowball etc.) and Cabbage (Varieties – Golden acre, Pride of India, Pusa Mukta etc.), Knolkhol (White vena) etc. Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices.	Development of water harvesting structure under NREGS for life saving irrigation Arrangement of seed under National Horticultural Mission
		Late Sali (Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chili		Growing of rabi field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation if required with recommended varieties and package of practices.	-

2.1.2 Drought - Irrigated situation

As the source of irrigation is basically STW and there is no any report on ground water depletion in the district; hence the question of draught-irrigated situation does not arise.

Some other situation like pre monsoon flood and hailstorm often experienced for which contingency plans are necessary and mentioned under 2.2.3

Condition				Suggested Contingency measures	Remarks on Implementation ^j
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	
Delayed release of water in canals due to low rainfall		Cropping system 1 :Rice-Rice	Rice-Rice	<ul style="list-style-type: none"> • Medium duration Kharif rice(Var: Satyranjan and Basundhra) • SRI practice • Community nursery 	
		Jute-Toria/Lentil/ pea	No Change	<ul style="list-style-type: none"> • Olitorious jute(var: Tarun) • Late sown toria variety(TS-38, TS-46) 	
		Rice- Potato	No Change	<ul style="list-style-type: none"> • Medium duration Kharif rice(Var: Satyranjan and Basundhra) • Potato (Var: Kufri Meha) 	
		Rice-Rice	No change	<ul style="list-style-type: none"> • Medium duration Kharif rice(Var: Satyranjan and Basundhara) • SRI practice • Varieties like Kanaklata, Jyoti, Swarnav for summer rice. 	
		Rice-Potato	No change	Medium duration rice varieties like Satyranjan , Basundhara, Koln , Disan	
	Rice-toria	No change	<ul style="list-style-type: none"> • Medium duration rice 		

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Cro ^p /cro ^{pp} ing system ^g	Change in cro ^p /cro ^{pp} ing system ^h	Agronomic measures ⁱ	Remarks on Im ^p lementation ^j
				varieties like Satyaranjan , Basundhara, Koln ^g , Disan ^g • Late sown toria (TS-38, TS-46)	

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		Remarks on Implementation ^j
			Change in crop/cropping system ^h	Agronomic measures ⁱ	
Limited release of water in canals due to low rainfall		Rice-Rice	No Change	SRI in summer rice	
		Rice- Toria	No change	Late sown toria variety (TS-38, TS-46)	
		Rice- Potato/ Lentil/ pea	No change	One irrigation at most critical stage (viz. stolon formation in potato, flowering in lentil)	

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		Remarks on Implementation ^j
			Change in crop/cropping system ^h	Agronomic measures ⁱ	
Non release of water in canals under delayed onset of monsoon in catchment					

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		Remarks on Implementation ^j
			Change in crop/cropping system ^h	Agronomic measures ⁱ	
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Tube well irrigated medium red soils	Cropping system 1:	NA		
Insufficiency of surface water for irrigation					

Condition	Suggested Contingency measures				Remarks on Implementation ^j
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	
Insufficient groundwater recharge due to low rainfall	Waterlogged medium deep black soils	Cropping system 1:	NA		

2.1.3 Pre monsoon flood and hailstorm under irrigated situation

Condition	Suggested Contingency measures				Remarks on Implementation ^j
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	
Pre monsoon flood	Medium / medium low /lowland land (sandy loam to clay loam)	Summer rice/ Early ahu with long duration local cultivars and hybrid rice variety	- Adoption of Short duration rice varieties like Luit, Kolong, dichang etc in case of summer rice/ early ahu rice	-Provision for drainage channel to remove excess water. - If crop attains maturity stage, harvest the crop at physiological maturity stage.	Preparation of drainage channel under MGNREGA
		Jute	Jute	- Provision for drainage channel to remove excess water. - If top dressing of N fertilizer is not possible, foliar spray of urea (11.5 kgN/ha) at 40-45 days and 55-60 days after sowing.,	Preparation of drainage channel under MGNREGA
	Upland (sandy loam to clay loam)	Summer vegetables	- Summer vegetables - If crop fails, plan for rabi crops	Provision for drainage channel to remove excess water.	Preparation of drainage channel under MGNREGA
		Fruits (banana, citrus etc)	-Fruits (banana, citrus etc - if crop fails, replanting of crops	Provision for drainage channel to remove excess water.	Preparation of drainage channel under MGNREGA

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Hail storm under irrigated condition	Medium / medium low /lowland land (sandy loam to clay loam)	Summer rice/ Early ahu with long duration local cultivars and hybrid rice variety	Adoption of Short duration rice varieties like Luit Kolong, Dichang etc.	-	-
		Jute	Jute	<ul style="list-style-type: none"> • Growing of green manure crops like Dhaincha along the border as wind barrier. 	-
	Upland (sandy loam to clay loam)	Summer vegetables	Summer vegetables/ high valued vegetable crops	<ul style="list-style-type: none"> • Installation of hail net • Plantation of wind break • Protected cultivation of high valued vegetable crop 	-Departmental schemes like NFSM, Technology Mission, RKVY for protected cultivation.
		Fruits (banana, citrus etc)	Mulberry banana cultivation	<ul style="list-style-type: none"> • Installation of hail net • Plantation of wind break 	

Condition	Suggested contingency measure			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water.	Excess rain water to be drained out through surface drainage channel to avoid submergence	<ul style="list-style-type: none"> -Excess rain water to be drained out through surface drainage channel to avoid submergence -Crop to be harvested at 	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage

	<ul style="list-style-type: none"> - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field. - Light hoeing and weeding 		physiological maturity stage.	
Winter rice	<ul style="list-style-type: none"> - Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field. - Light hoeing and weeding 	Excess rain water to be drained out through surface drainage channel to avoid submergence	<ul style="list-style-type: none"> - Excess rain water to be drained out through surface drainage channel to avoid submergence. - Crop to be harvested at physiological maturity stage 	- Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage
Sesame	<ul style="list-style-type: none"> - Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m - Light hoeing and weeding 	Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m	<ul style="list-style-type: none"> - Excess rain water to be drained out through surface drainage channel of 25cm wide, 15cm deep spaced at 6 m. - Crop to be harvested at physiological maturity stage. 	- Proper drying of grains to maintain optimum moisture percentage for storage
Jute	<ul style="list-style-type: none"> - Drainage - If top dressing of N fertilizer is not possible, foliar spray of urea (11.5 kgN/ha) at 40-45 days and 55-60 days after sowing., 	Drainage	Drainage	Proper drying
Sugarcane	<ul style="list-style-type: none"> - First & second earthing up at 45-60 and 90-120 days after planting, respectively. - Make trenches/furrows in between ridges to facilitate drainage of excess water 	Drainage - Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	Drainage- Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall.	-

	during high rainfall.			
Horticulture				
Chili	-Drainage - Plant protection measures against anthracnose	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	-Drainage -Plant protection measures against fruit rot --Crop to be harvested at physiological maturity stage.	-Shifting of the produce to drier place. - select the produce immediately.
Potato	-Drainage -Proper plant protection measure against late blight -Earthing up at 25 and 60 days after planting.	-Drainage -Proper plant protection measure against late blight	-Drainage -Harvesting of tuber	-proper drying of the produce. -Keep drier place before storage
Vegetables	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	-Drainage - Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, cold storage.
Heavy rainfall with high speed winds in a short span ²				
Summer rice	-Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field.	- Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field	-Crop to be harvested at physiological maturity stage.	-Proper drying of grains to maintain optimum moisture percentage (12-14%) for storage

Jute	<ul style="list-style-type: none"> - If top dressing of N fertilizer is not possible, foliar spray of urea (11.5 kgN/ha) at 40-45 days and 55-60 days after sowing., -Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier. 	<ul style="list-style-type: none"> -Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier. 	<ul style="list-style-type: none"> -Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier. 	-Proper drying
Maize	<ul style="list-style-type: none"> - Proper drainage - Provision for wind breaks 	<ul style="list-style-type: none"> - Proper drainage - Provision for wind breaks 	-Crop to be harvested at physiological maturity stage.	-proper drying
Sugarcane	<ul style="list-style-type: none"> -First & second earthing up at 45-60 and 90-120 days after planting, respectively. --Make trenches/furrows in between ridges to facilitate drainage of excess water during high rainfall. 	<ul style="list-style-type: none"> -Drainage -Stripping & propping 	<ul style="list-style-type: none"> -Drainage -Stripping & propping 	Harvesting should be done before rain as far as possible Drying to remove excess moisture of canes
Winter rice	<ul style="list-style-type: none"> -Sow rice seed in raised nursery bed with 30cm gap between two beds which can be utilized to drain out excess water. - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field. 	<ul style="list-style-type: none"> - Excess rain water to be drained out through surface drainage channel to avoid submergence in the main field 	-Crop to be harvested at physiological maturity stage.	-Proper drying of rains to maintain optimum moisture percentage (12-14%) for storage
Horticulture				
Banana	Drainage, Make trenches/furrows in	Drainage, Make trenches/furrows in	Drainage, Make trenches/furrows in	Shifting of the produce to drier place

	between ridges to facilitate drainage of excess water, propping.	between ridges to facilitate drainage of excess water, propping.	between ridges to facilitate drainage of excess water, propping.	
Vegetable (climbers)	Drainage, make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage ,Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place, Cold storage.
Okra	Drainage	Drainage , Application of hormones, nutrient, sprays to prevent flower drop.	Drainage	Shifting of the produce to drier place ,Harvesting should be done before rain as far as possible, Drying to remove excess moisture of produce.
Outbreak of pests and diseases due to unseasonal rains				
summer rice	-Application of pesticides like chloropyrifos or Monochrotophos @ 2 ml/lit against stem borer, leaf folder, case worm. -Adoption IPM module. -Alternate flooding and drying against case worm. -Application of carbendazim @ 1 g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.	-Rouging if infected plant , - Application of pesticides like chloropyrifos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module against stem borer -Spraying of pesticide should not coincide polination time. -Application of carbendazim @ 1 g/l against blast and sheath blight. Water from the sheath blight infested field should not be allowed to enter disease free field.	-	-Insect pest and disease infested seed/rains should be discarded
Winter rice	-Application of pesticides like chloropyrifos or Monochrotophos @ 2 ml/lit against stem borer, leaf folder, case worm. -Adoption IPM module.	-Rouging if infected plant , - Application of pesticides like chloropyrifos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module	-	Insect pest and disease infested seed/rains should be discarded

	<ul style="list-style-type: none"> -Alternate floodin^g and dr^yin^g a^gainst case worm. -Application of carbendazim @ 1 g/l a^gainst blast and sheath bli^ght. Water from the sheath bli^ght infested field should not be allowed to enter disease free field. 	<ul style="list-style-type: none"> a^gainst stem borer -Spra^yin^g of pesticide should not coincide polination time. -Application of carbendazim @ 1 g/l a^gainst blast and sheath bli^ght. Water from the sheath bli^ght infested field should not be allowed to enter disease free field. 		
Jute	<ul style="list-style-type: none"> - Jute hair^y caterpillar, semi looper etc. are to be hand picked and destro^yed by putin^g in kerosinazed water. - Alternatively, apply Fenitrothion 50 Ec @ 1ml/l(3 spra^yin^gs) - In case of root rot, stem rot, seedlin^g bli^ght, apply carbendazim @ 1 g/l of water. Application of potash should be increased up to 50 k^g/ha 	-	-	-Discard insect pest and disease infested plants to maintain the quality.
Black ^g ram	<ul style="list-style-type: none"> - A^gainst YMV, spra^y Dimethoate @ 2ml/l (2 -3 sprayin^gs) - A^gainst jassids, aphids, flee beetle, leaf folder, spra^y Malathion 50 Ec @ 2 ml/l of water. - A^gainst dampin^g off, root rot and seedlin^g bli^ght, apply carbendazim @ 1^g/l of water. 	<ul style="list-style-type: none"> - A^gainst YMV, spra^y Dimethoate @ 2ml/l (2 -3 sprayin^gs) - A^gainst jassids, aphids, flee beetle, leaf folder, spra^y Malathion 50 Ec @ 2 ml/l of water. 	<ul style="list-style-type: none"> - A^gainst pod borer & pod bu^g, spra^y Malathion 50 Ec @ 2 ml/l of water. 	Insect pest and disease infested seed/ ^g rains should be discarded

Horticulture				
Potato	<ul style="list-style-type: none"> -Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water 	-	-	-Discard disease and insect infested tubers.
Tomato	<ul style="list-style-type: none"> -Depending on the weather condition, Mancozeb @ 2.5 g/l should be sprayed as prophylactic measures against late blight. -Against late blight, 6 spraying with Mancozeb 2.5g/l of water at an interval of 12 days. -Use of sticker is essential in the spray solution for spraying during rainy weather. -Drainage of excess water 	-	-	-Discard disease and insect infested fruits.

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				

Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-Drainage of excess water	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head in bamboo bar for drying
Winter rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-Drainage of excess water	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Jute	-Drainage of flood water	-Drainage of flood water -Folia application of urea instead of top dressing is advocated	-	-Harvested plants should be made in bundles and to be kept in standing position for 2-4 days.
Sesame	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Black gram	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Horticulture /Plantation crops				
Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.
Kharif	-Drainage of flood water	-Drainage of flood water	-Drainage of flood water	-Harvesting of produce as

Vegetable	-Hoeing in between lines for aeration in root zone after flood	-Hoeing in between lines for aeration in root zone after flood	-Hoeing in between lines for aeration in root zone after flood	early as possible
Arecanut	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	-
Continuous submergence for more than 2 days ²				
Summer rice	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.	-Drainage of excess water	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying

Winter rice	<p>-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed.</p> <p>-If seedlings are damaged by flood water, resowing may be done with the following varieties-</p> <p>-If transplanting can be done by mid August, select varieties like Satyaranjan, Basundhara, IR -36, Jaya etc. Seedlings should be raised in non flood prone or high land area.</p> <p>- If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil.</p> <p>.</p>	<p>-Drainage of excess water</p> <p>-If crop is damaged by flood, the nursery may be raised with the following varieties-</p> <p>- If transplanting is possible during last part of August, short duration varieties such as Luit, Kolong, Dishan etc. can also be selected (transplanting up to last part of August). 20-25 days old seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hil.</p> <p>-If flood damages crop during last part of August and there is no time to raise seedlings, direct seeding (wet seeding) of extra short duration high yielding varieties such as Luit, Kolong, Dichan etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1st week of September. Sprouted seed of 75 kg/ha is to be broadcast in puddle field.</p>	-Drainage of excess water	Harvesting at physiological maturity stage, tying the harvested head and transferred to dry place for drying
Jute	<p>-Drainage of flood water</p> <p>- Re sowing may required if crop is damaged by flood.</p>	<p>-Drainage of flood water</p> <p>-Foliar application of urea instead of top dressing is advocated</p>	-	-Harvested plants should be made in bundles and to be kept in standing position for 2-4 days.
Sesame	<p>-Drainage of flood water</p> <p>- Re sowing may required if crop is damaged by flood.</p> <p>-Hoeing in between lines for aeration in root zone after flood</p>	<p>- Drainage of flood water</p> <p>-Hoeing in between lines for aeration in root zone after flood.</p>	- Drainage of flood water	<p>-Harvesting at physiological maturity stage.</p> <p>-Proper drying of produce</p>

Black gram	-Drainage of flood water - Re sowing may required if crop is damaged by flood. -Hoeing in between lines for aeration in root zone after flood	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	- Drainage of flood water -Hoeing in between lines for aeration in root zone after flood.	-Harvesting at physiological maturity stage. -Proper drying of produce
Horticulture / Plantation crops				
Banana	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping. -Replanting if crop is damaged by flood	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.	-Drainage, -Make trenches/furrows in between rows to facilitate drainage of excess water, propping.
Kharif Vegetable	-Drainage of flood water - Re sowing may required if crop is damaged by flood. -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Drainage of flood water -Hoeing in between lines for aeration in root zone after flood	-Harvesting of produce as early as possible
Areca nut	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water Replanting	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	Drainage, Make trenches/furrows in between rows to facilitate drainage of excess water	-

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone : Not Applicable

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave ^p				
Cold wave ^q				
Frost				

Hailstorm

Cyclone

Sand deposition or heavy siltation

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	<p>Cultivation of perennial fodder Encouraging hay making Silage preparation Making facility for block feed Quality up gradation of inferior quality roughages like paddy straw, wheat straw etc. with urea treatment.</p> <p>Mass awareness on feeding the livestock unconventional feeds and various byproducts. Insurance</p>	<p>Feeding fodders from perennial trees. Feeding already prepared silage and hay. Providing feed blocks, unconventional feeds and various byproducts. Providing urea treated straw.</p>	<p>Availing insurance Culling of affected and unproductive animals. Fodder rejuvenation</p>
Drinking water	<p>Storing water in tanks for the hard period Insurance</p>	<p>Offering stored water to the livestock. Animals not to be exposed outside</p>	<p>Culling of affected and unproductive animals.</p>
Health and disease management	<p>Timely vaccinations against various diseases. Veterinary preparedness like storing required medicines and other accessories</p>	<p>Immediate treatment of the sick animals. Conducting animal health camps during the period.</p>	<p>Culling of unproductive animals Availing insurance</p>

	<p>Mass awareness programme on management of livestock during draught.</p> <p>Insurance of animals</p>		
Floods			
Feed and fodder availability	<p>Maintenance of fodder bank in community land</p> <p>Silage preparation</p> <p>Mass awareness on feeding the livestock unconventional feeds and various byproducts.</p> <p>Stocking of concentrated feed in sufficient quantity.</p> <p>Insurance</p> <p>Raised platform</p>	<p>Providing feed blocks, unconventional feeds and various byproducts</p> <p>Keep animals in safe place like raised platform/upland</p>	<p>Availing insurance</p> <p>Culling of affected and unproductive animals.</p> <p>Fodder rejuvenation</p> <p>Health check-up and vaccination</p>
Drinking water	<p>Storing water in tanks</p> <p>Insurance</p>	<p>Offering stored water to the livestock.</p>	<p>Treating of drinking water.</p>
Health and disease management	<p>Timely vaccinations against various diseases.</p> <p>Veterinary preparedness like storing required medicines and other accessories</p> <p>Mass awareness programme on management of livestock during draught.</p>	<p>Immediate treatment of the sick animals.</p> <p>Conducting animal health camps during the period.</p>	<p>Culling of unproductive animals</p> <p>Availing insurance</p> <p>Health check-up and vaccination</p>
Cyclone			
Feed and fodder availability			

Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			

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	Insurance Storage of feed	Offering stored feed	Availing Insurance Culling unproductive birds.	
Drinking water	Preserving water in tank	Offering stored water	Culling unproductive birds.	
Health and disease management	Timely vaccinations against various diseases. Veterinary preparedness Mass awareness programme on management of poultry during drought.	Immediate treatment of the sick animals. Conducting animal health camps during the period.	Culling of unproductive birds Availing insurance	Linkages may be made with the State Animal Husbandry and Veterinary Department for vaccination and other health measures through their various schemes.

Floods				
Shortage of feed ingredients	Insurance Storage of feed	Immediate treatment of the sick birds	Culling of unproductive birds Availing insurance	
Drinking water	Preserving water in tank	Immediate treatment of the sick birds	Culling of unproductive birds Availing insurance	
Health and disease management	Timely vaccinations against various diseases. Veterinary preparedness Mass awareness programme on management of poultry during flood	Immediate treatment of the sick birds	Culling of unproductive birds Availing insurance	
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				

^abased on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/inflow	Water supply from any other sources.	Water supply from other sources and reduce the stock.	Partial harvesting and lime application.
(i) Changes in water quality	Thinning out of stock against reduced dissolved oxygen and space Removal of aquatic weeds	Undulation of water surface to increase the dissolved oxygen.	Remove aquatic vegetation
(i) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ul style="list-style-type: none"> For pond construction select soils with sufficient clay for retention of water. Apply sufficient organic manure during preparation to minimize water loss through seepage. Insurance Excavation of bore wells Reduce biomass and stocking density through partial harvesting. Select the fishes attainable 	<ul style="list-style-type: none"> Pump in water from other water source (nearby spring, stream, rivers etc) or ground water, if any. Reduce food for minimum metabolism. Restrict fertilizer for preventing algal bloom and minimum stress. Dig deep trench in convenient part of the pond to save brood fishes. Careful observation on daily 	<ul style="list-style-type: none"> Extended seed production Restock the pond. Integrated fish farming Short duration culture of species that are fast growing in initial stage and can be marketed at small size (minor and medium carps). Air breathing fish culture Claim compensation with support

	<p>marketable size to minimize loss.</p> <ul style="list-style-type: none"> • Stock fishes that can thrive low water depth, like air breathing fishes. • Maintenance of proper record for claiming compensation, especially in schemes assisted by Govt. or financial institutes. • Planning for rain water harvest. 	<p>basis.</p> <ul style="list-style-type: none"> • Scare away birds and other animals (attracted by shallow water to catch fish) – may be vector for diseases. 	<p>of record and documents.</p> <ul style="list-style-type: none"> • Paddy cum fish culture
(i) Impact of salt load build up in ponds / change in water quality	<ul style="list-style-type: none"> • Thinning out of stock against reduced dissolved oxygen and space 	<ul style="list-style-type: none"> • Recirculation of water and/or aeration. • Careful observation on daily basis. 	-
(i) Any other	-	-	-
2) Floods			
A. Capture			
Marine	-	-	-
Inland	<ul style="list-style-type: none"> • Preparation for pen and cage culture 	<ul style="list-style-type: none"> • Pen & cage culture • Can get engaged in other related activities like net and gear making. 	<ul style="list-style-type: none"> • Desilting & weed removal if possible
(i) No. of boats / nets/damaged			
(i) No. of houses damaged			
(i) Loss of stock			<ul style="list-style-type: none"> • Pen & cage culture
(iv) Changes in water quality			
(v) Health and diseases			
B. Aquaculture			

<p>(i) Inundation with flood water</p>	<ul style="list-style-type: none"> • Insurance • Repairing, turfin^g and compaction of peripheral embankments. • Horticulture on the embankment to prevent erosion. • Sufficient bamboo poles and nylon nets to be kept ready. • ‘High stockin^g multiple harvestin^g’ can be taken up. • Sell out the fishes attainin^g marketable size to minimize loss. • Maintenance of proper record for claimin^g compensation, especially in schemes assisted by Govt. or financial institutes. 	<ul style="list-style-type: none"> • Surround the pond with nets supported by bamboo poles to prevent escape of fish. • Supply sufficient food to fishes to reduce tendency of escapin^g from the pond. • Harvestin^g of fish quickly 	<ul style="list-style-type: none"> • Desiltin^g. • Restock the pond if original stock escapes. • Integrated fish farmin^g • Short duration culture of species that are fast growin^g and can be marketed at small size. • Claim compensation with support of record and documents. • Removal of unwanted/ predatory fish from pond before stockin^g. • Paddy cum fish culture
<p>(i) Water contamination and changes in water quality</p>	<ul style="list-style-type: none"> • Prevent entry of water from outside. • Precaution to prevent entry of pesticide/insecticide laden water from nearby agricultural land. • Apply lime regularly as per recommendation. 	<ul style="list-style-type: none"> • Apply lime regularly as per recommendation. 	<ul style="list-style-type: none"> • Apply lime regularly as per recommendation. • Remove muck and debris, if entered with flood. • Apply preventive agents (e.g. CIFAX) before onset of winter.
<p>(i) Health and diseases</p>			
<p>(vi) Any other</p>			<ul style="list-style-type: none"> • Small scale homestead ornamental fish production, dependin^g on the market.

3. Cyclone / Tsunami			
A. Capture	-	-	-
Marine	-	-	-
(i) Average compensation paid due to loss of fishermen lives	-	-	-
(i) Avg. no. of boats / nets/damaged	-	-	-
(i) Avg. no. of houses damaged	-	-	-
Inland	-	-	-
B. Aquaculture	-	-	-
(i) Overflow / flooding of ponds	-	-	-
(i) Changes in water quality (fresh water / brackish water ratio)	-	-	-
(i) Health and diseases	-	-	-
(iv) Loss of stock and inputs (feed, chemicals etc)	-	-	-
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	-	-	-
(vi) Any other	-	-	-
4. Heat wave and cold wave	-	-	-
A. Capture	-	-	-
Marine	-	-	-
Inland	-	-	-

B. Aquaculture	-	-	-
(i) Chan'es in pond environment (water qualit ^y)	<ul style="list-style-type: none"> Apply lime re'ularly as per recommendation. Apply preventive a'ents (e.g. CIFAX) before on set of winter. 	<ul style="list-style-type: none"> Apply lime re'ularly as per recommendation. Restrict application of fertilizer as per requirement. 	<ul style="list-style-type: none"> Apply lime re'ularly as per recommendation.
(i) Health and Disease mana'ement			
(i) Any other	-	-	-

a based on forewarnin' wherever available