State: ASSAM

Agriculture Contingency Plan for District: DHUBRI

1.0 District Agriculture Profile*				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Assam And Bengal Plain, Hot Subhumid To Humid (Inclusion Of Perhumid) Eco-Region (15.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP)	Lower Brahmaputra Valley Zone (AZ-4)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Kamrup, Dhubri, Bongaigaon, Nalbari, Barpeta, Kokrajhar, Goalpara		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		25.82 to 26.22'N -89° 58' 0 E	89.42 to 90.12 ' E 26° 1' 60 E	30 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RARS Gossaingaon, Assam Agricultural University, District: Kokrajhar		
	Mention the KVK located in the district with full address	KVK, Dhubri, AAU, Bilasipara, District - Dhubri Assam, PIN: 783348		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RARS Gossaingaon, Assam Agricultural University, District: Kokrajhar		

1.2	Rainfall	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1486.3	1st week of June	Last week of september
	NE Monsoon(Oct-Dec):	218.5	2nd week of October	2nd Week of November
	Winter (Jan- February)	16.5	-	-
	Summer (March-May)	517.3	-	-
	Annual	2238.6	-	-

(Source: Department of Agriculture, Dhubri, Assam. Based on rainfall data from 2001 to 2009)

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)	236.126	144.152	1.664	16.909	2.156	6.558	12.942	-	7.560	58.303

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area ('000 ha)**	Percent (%) of total geographical area
	1. Sandy loam	14.15	
	2. Clay loam	5.12	
	3. Tilla / red	3.31	
	4. Clay	1.73	
	5. Sandy	1.25	
	Others (specify):		

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	130.034	202

	Area sown more than once	-
	Gross cropped area	264.497

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	39.472		
	Gross irrigated area	43.089		
	Rainfed area	-		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals		0.505	1.27
	Tanks		Nil	Nil
	Open wells		-	-
	Bore wells		37.672	95.43
	Lift irrigation schemes		-	-
	Micro-irrigation			--
	Other sources (please specify)		1.080	2.73
	Total Irrigated Area		52.078	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.6. a. Fertilizer and Pesticides use Type Total quantity (tonnes)

Name of fertilizers	2001-02		2002-03		2003 -04		2004-05		2005-06	
	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi
Urea	3311	9600	6741	14992	6040.5	19778.3	4409	16539.5	6622	17085
SSP	2278	6254	3250.5	10584	5538	11817	5743.5	10192.5	5980	10560
DAP	1887	4813	3155	9379	3918	9630	3023	8396	3422	8481
MOP	457	2295	1329	2989	3065	3572	2006	3700	2336	3766
Consumption(Kg/ha)	108		171		207		170		184	

Source: District Agriculture Office, Dhubri

1.7 Area under major field crops & horticulture (2007-08)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Summer Paddy							49.46	49.46
	Winter Paddy						45.935		45.935
	Autumn Paddy			20.86					20.86
	Rapseed & Mustard						18.7		18.7
	Wheat						10.24		10.24
	Black gram						4.251		4.251
	Nizer						1.755		1.755
	Seasamum						1.545		1.545
	Lentil						1.365		1.365
	Linseed						0.883		0.883
	Pea						0.435		0.435
	Groundnut						0.250		0.250
	Green gram						0.163		0.163

	S.No.	Horticulture crops - Fruits	Area ('000 ha)		
			Total	Irrigated	Rainfed
	1	Banana	1.625		1.625
	2	Guava	0.180		0.180
	3	Jackfruit	0.450		0.450
	4	Litchi	0.015		0.015
	5	Pineapple	0.100		0.100
		Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	1	Rabi Vegetable	7.800		
	2	Potato	5.850		
	3	Kharif Vegetable	3.728		
		Medicinal and Aromatic crops			
		Plantation crops			
	Others (Specify)	Eg., industrial pulpwood crops etc.			
		Fodder crops			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Indigenous cattle			505.200
	Improved / Crossbred cattle			3.785
	Buffaloes (local low yielding)			21.564
	Improved Buffaloes			
	Goat			215.844
	Sheep			114.320
	Pig			8.121
	Mithun			-
	Yak			-
	Others (Horse, mule, donkey etc., specify)			
	Commercial dairy farms (Number)			
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial			
	Backyard			

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	i) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of vilage 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						
Ponds & Tanks			2345	-		4.017
Beels			5520	-		4.135
Rivers			19614	-		3.204
Swamp/ low-lying area			5957	-		1.28 1
Paddy fields			30696	-		1.061
Others			2516	-		1.486

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

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)										
	Summer Paddy					173.110	3500	173.110	3500	
	Winter Paddy			110.244	2400			110.244	2400	
	Autumn Paddy	31.290	1500					31.290	1500	
	Rapseed & Mustard			14.025	750			14.025	750	
	Wheat			122.88	1200			122.88	1200	
	Black gram			2.797	660			2.797	660	
	Nizer			0.721	410			0.721	410	
	Seasamum			0.692	450			0.692	450	
	Lentil			0.607	450			0.607	450	
	Linseed			0.393	450			0.393	450	
	Pea			0.237	550			0.237	550	
	Groundnut			0.04 1	170			0.04 1	170	
	Green gram			0.080	490			0.080	490	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Banana							26.813	16500	
	Guava							1.400	14000	
	Jackfruit							9.450	21000	
	Litchi							7.200	40000	
	Pineapple							0.105	7000	

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			

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 Paddy	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 Paddy(Early ahu 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
	Rapseed & 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	

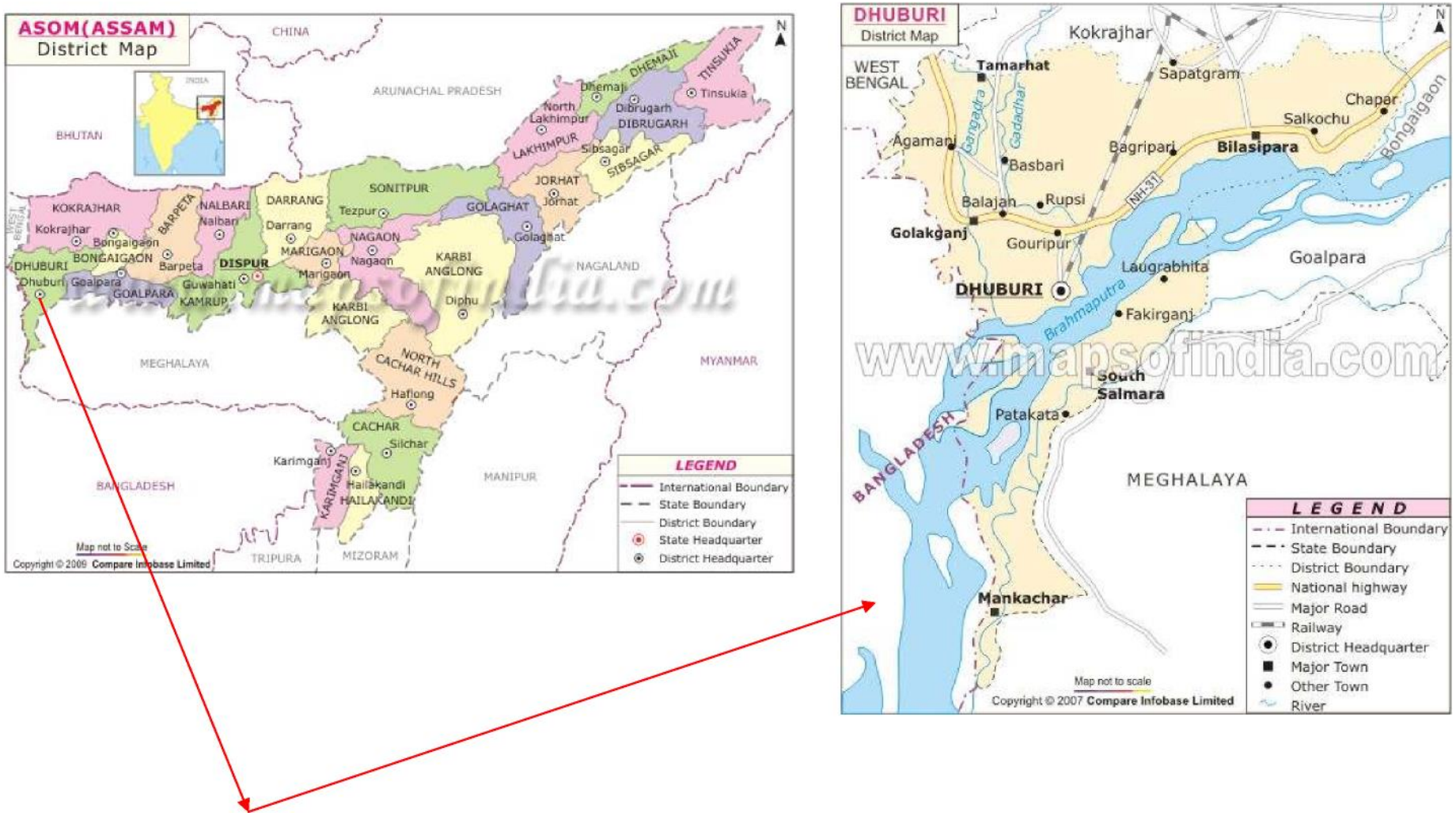
	Arecanut and coconut	Ganoderma wilt , White grub		
	Jack fruit	Fruit rot		
	Vegetables	Bacterial wilt, Fungal wilt, Damping off, La te blight in potato, anthracknose in chilli, White grub, Fruit and shoot borer, TLCV	Collar rot, b l i ght,	

*When contingency occurs in six out of 10 years

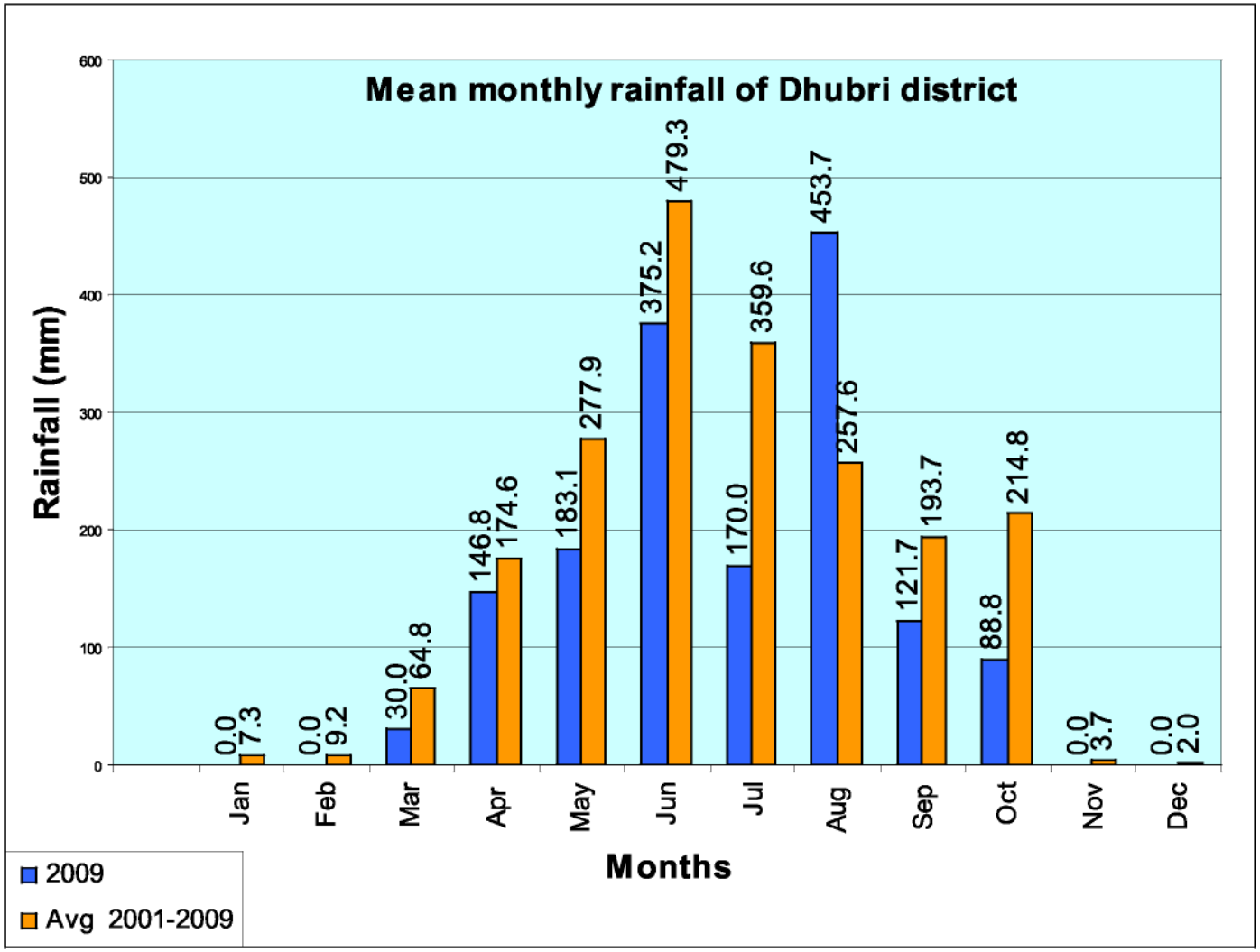
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure – 1: LOCATION MAP OF DHUBRI DISTRICT IN ASSAM

(Source: mapsofindia.com)



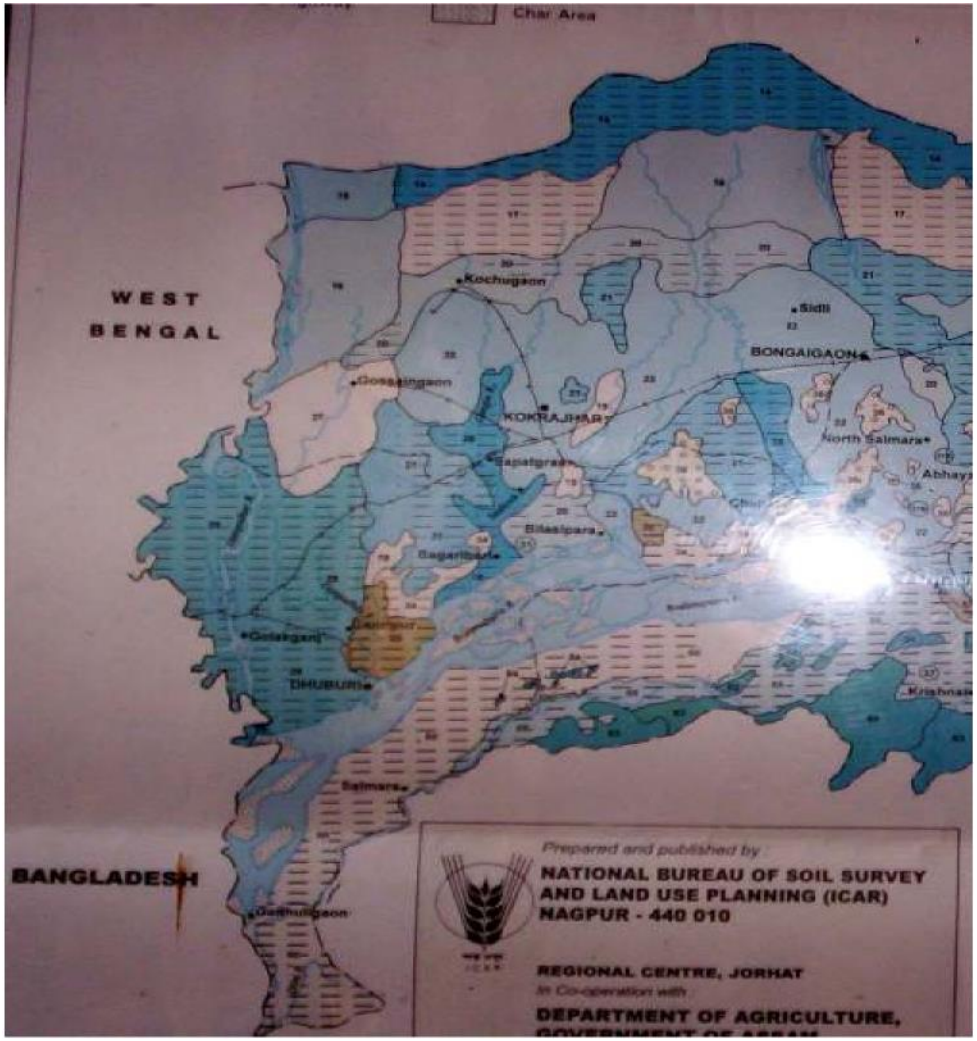
Annexure – 2: MEAN ANNUAL RAINFALL OF DHUBRI DISTRICT



Source: - De[p]artment of A[g]riculture, Dhubri, Assam

Annexure – 3: SOIL MAP OF DHUBRI

Source: NBSSLUP (Secondary Source: Assam Agricultural University, Jorhat)



INDEX	
	Very deep, imperfectly drained, coarse loamy soils with slight erosion and moderate flooding
	Very deep, well drained, coarse silty soils with modrate flood hazard
	Very deep, moderately well drained, coarse loamy soils with moderate flooding
	Very deep, well drained, coarse loamy soils with moderate erosion and moderate flooding
	Deep, moderately well drained, coarse silty soils with slight erosion and moderate flooding

2.0 Strategies for weather related contingencies 2.1

Drought

2.1.1 Rainfed situation

Condition		Suggested Contingency measures			
Early season drought (delayed onset)	Major Farming situation[a]	Crop/ cropping system[b]	Change in crop/ cropping system[c]	Agronomic measures[d]	Remarks on Implementation[e]
Delay by 2 weeks 3rd week of June	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Rice (DS) / Summer vegetables - Black gram/Sesame	No Change	-Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/chilli	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/Chilli	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 vegetables/Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Kharif (Kharif)	No Change	- Growing of submergence tolerant rice	- Technology showcasing

		–Wheat/Potato/Rabi vegetables/Chilli		varieties such as Jalashree, Jalkuwari which can tolerate 12-15 days submergence (transplanting within July). Seedlings should be raised in non flood prone or high land area. -If flood water recedes early and transplanting can be done by mid August, select varieties like Satyaranjan, Basundhara, IR -36, Jaya etc. Seedling s 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, 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/hill. - For chronically flood affected areas, Mano har Sali, Andrew Sali, Salpona e tc. and traditional photosensitive coarse grain rice 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 /hill. Community n ursery may be raised in non- flood prone or high land for raising of rice seedlings. - Select delayed plantin rice varieties like Prafulla and Gitesh with up to 60 days old seedlings (Sowing in the nursery be d within June). Seedlings should be raised in non flood prone or high land area.	programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed
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)* Month: 1st week of July	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Rice (DS) / Summer vegetables - Black gram/Sesame	No Change	-Recommended package of practices for normal sowing.	-
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/Chilli	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 of rice 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 rice varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedlings should be transplanted at 20x1 5 cm spacing with 4-5 seedlings/hill. - Rice varieties such as Pankaj, Kushal, Lakhimi can be grown up to August 15 with 45 -50 days old seedlings. -Rice 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.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of see d

				About 10 kg seed/ha is reᵠuired with closer sᵖacinᵍ (20 cm x 20 cm) and 6-8 seedlinᵍs/hill.	
		Jute / Rice(Kharif)-Toria / Lentil/ Wheat / Potato / Rabi veᵍetables/Chilli	No chanᵍe	-Growinᵍ of medium duration rice varieties such as Satyaranjan, Basundhara, IR-36, Jaya etc (transᵖlantinᵍ up to mid Auᵍust). - Short duration rice 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 20x1 5 cm sᵖacinᵍ with 4-5 seedlinᵍs/hill. - Rice varieties such as Pankaj, Kushal, Lakhimi can be ᵍrown up to Auᵍust 15 with 45 -50 days old seedlinᵍs. --Rice 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 reᵠuired with closer sᵖacinᵍ (20 cm x 20 cm) and 6-8 seedlinᵍs/hill.	- Technoloᵍʸ showcasinᵍ ᵖroᵍramme of AAU and other seed ᵖroduction ᵖroᵍrammes of state deᵖt of aᵍriculture, Assam as source of seed
		Rice (kharif) – Rice (summer)	No chanᵍe	-Growinᵍ of medium duration rice varieties such as Satyaranjan, Basundhara, IR-36, Jaya etc (transᵖlantinᵍ up to mid Auᵍust). - Short duration rice 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 20x1 5 cm sᵖacinᵍ with 4-5 seedlinᵍs/hill. - Rice varieties such as Pankaj, Kushal, Lakhimi can be ᵍrown up to Auᵍust 15 with 45 -50 days old seedlinᵍs. --Rice 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	- Technoloᵍʸ showcasinᵍ ᵖroᵍramme of AAU and other seed ᵖroduction ᵖroᵍrammes of state deᵖt of aᵍriculture, Assam as source of seed

				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/hill.	
	Flood prone (Sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Rice (Late Kharif) –Wheat/Potato/Rabi vegetables/Chilli	No change	--If flood water recedes early and transplanting can be done by mid August, select rice varieties like Satyaranjan, Basundhara, IR -36, Jaya etc. Seedlings should be raised in non flood prone or high land area. - If transplanting is possible during last part of August, short duration rice 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 20x1 5 cm spacing with 4-5 seedlings/hill. - For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain rice 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/hill. 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	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed

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Condition		Suggested co		
Early season drought (delayed onset)	Major Farming situation[a]	Crop/ cropping system[b]	Change in crop/ cropping system[c]	
Delay by 6 weeks Month: 3rd week of July	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	No Change	-Recommended
		Rice (DS) / Summer vegetables - Black gram/Sesame	No Change	-Recommended
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/Chilli	No Change	-Recommended

	Rainfed medium/ medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	- Short duration rice 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 20x1 5 cm spacing with 4-5 seedlings/hill. --Rice 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/hill.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed
		Jute / Rice(Kharif)-Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chilli	No change	- Short duration rice 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 20x1 5 cm spacing with 4-5 seedlings/hill. --Rice 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/hill.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed
		Rice (kharif) – Rice (summer)	No change	- Short duration rice 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 20x1 5 cm spacing with 4-5 seedlings/hill. --Rice 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/hill.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed
	Flood	Summer vegetables/Jute –	No Change	-Recommended package of practices for normal sowing.	-

	prone (Sandy loam to clay loam)	Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli			
		Rice (Late Kharif) –Wheat/Potato/Rabi vegetables/Chilli	No change	- 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 seedlings should be transplanted at 20x1 5 cm spacing with 4-5 seedlings/hill. - For chronically 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/hill. 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, 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.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed

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 8 weeks (Specify month)* 1st week of	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Rice (DS) / Summer vegetables - Black gram/Sesame	No Change	-Recommended package of practices for normal sowing.	-
august		Summer vegetables - Toria /	No Change	-Recommended package of practices for	-

		Lentil / Wheat / Potato / Rabi vegetables/Chilli		normal sowing.	
	Rainfed medium /medium lowland (Sandy loam to clay loam)	Rice(Kharif) monocropping	No change	- Short duration rice varieties such as Luit, Kolong, Dis hang e tc. can al so 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/hill. --Rice 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 clo ser spacing (20 cm x 20 cm) and 6-8 seedlings/hill -Direct seeding (wet seeding) of extra short duration high yielding rice 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.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed.
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi vegetables/Chilli	No change	- Short duration rice 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/hill. --Rice 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	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam

				closer spacing (20 cm x 20 cm) and 6-8 seedlings/hill -Direct seeding (wet seeding) of extra short duration high yielding rice 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.	
		Rice (kharif) – Rice (summer)	No change	- Short duration rice 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/hill. --Rice 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 see dlings. About 10 kg seed/ha is required with clo ser spacing (20 cm x 20 cm) and 6-8 seedlings/hill -Direct seeding (wet seeding) of extra short duration high yielding rice 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.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed.
	Flood prone (Sandy loam to clay loam)	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli	No Change	-Recommended package of practices for normal sowing.	-
		Rice (Late Kharif) –Wheat/Potato/Rabi	No change	- If transplanting is possible during last part of August, short duration rice	- Technology s howcasing programme

		vegetables/Chilli		varieties such as Luit, Kolong, Dishang etc. can also be selected (transplanting up to last part of August). 20-25 days old seedlings should be transplanted at 20x1 5 cm spacing with 4-5 seedlings/hill. - For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photosensitive coarse grain rice 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/hill. 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 rice 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.	of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed.

Condition		Suggested Contingency measures			
Early season drought (Normal onset)	Major Farming situation[a]	Crop/ cropping system[b]	Change in crop/ cropping system[c]	Soil nutrient & moisture conservation measures[d]	Remarks on Implementation[e]
Normal onset folowed by 15-20 days dry spe l after sowing leading to poor	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	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/Sesame	No Change	-Life saving supplemental irrigation -Weeding at critical stage s 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/Chilli	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 drough t 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 recommen ded. 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/Chilli	No change		
		Rice (kharif) – Rice (summer)	No change		

	Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potat o/Rabi vegetables/Chilli	No Change	-Supplementary life saving irrigation at critical crop stages	-Development of water harvesting structure under NREGS
		Rice (Late Kharif) –Wheat/Potato/Rabi vegetables/Chilli	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, d ry 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 r ice nursery may be converted into channel to supply water to keep the raised beds moist in the even t 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

Condition		Suggested Contingency measures			
Mid season	Major	Crop/ cropping	Change in crop/	Soil nutrient & moisture conservation measures[d]	Remarks on

drought (long dry spel, consecutive 2 weeks rainless (> 2.5 mm) period)	Farming situation[a]	system[b]	cropping system[c]		Implementation[e]
At vegetative stage	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	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 veg etab les - Black gram/Se same	No Chang e		
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables /Chilli	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 @ 1 g/l against brown spot disease in rice. -Weeding at critical s tages 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/Chilli	No change		
		Rice (kharif) – Rice (summer)	No change		
	Flood prone	Summer	No Change	-Supplementary life saving irrigation at critical crop stages	--Development

		vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli			of water harvesting structure under NREGS for life saving irrigation - Arrangements of pump sets under NFSM and RKVY
		Rice (Late Kharif) – Wheat/Potato/Rabi vegetables/Chilli	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		Suggested Contingency measures			
Mid season drought (long dry spel)	Major Farming situation[a]	Crop/ cropping system[b]	cropping system[c]	Soil nutrient & moisture conservation measures[d]	Remarks on Implementation[e]
At reproductive stage	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	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/Sesame	No Change		

		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables /Chilli	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 gro wth - 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/Chilli	No change		
		Rice (kharif) – Rice (summer)	No change		
	Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato /Rabi vegetables/Chilli	No Chan ge		

		Rice (Late Kharif) –Wheat/Potato/Rabi ve[g]etables/Chilli	No chan[g]e	-Su[pp]lementary life savin[g] irri[g]ation at critical cro[p] sta[g]es --To[p] dressin[g] of additional [q]uantities of MOP @ 37.5 k[g]/ha and incor[p]oration is recommended in rice -S[p]rayin[g] of 2% KCL solution on leaves of rice if and when drou[g]ht a[pp]ears. -To[p] dressin[g] of urea may be delayed u[p]to headin[g] sta[g]e of rice if drou[g]ht [p]revails at the sta[g]es of top dr essin[g] - If cro[p] fails, [p]lan for rabi ve[g]etables, oilseeds,	-Develo[p]ment of water harvestin[g] structure under NREGS

			pulses etc.		

Condition		Suggested Contingency measures			
Terminal drought	Major Farming situation[a]	Crop/ cropping system[b]	Crop management[c]	Rabi crop planning[d]	Remarks on Implementation[e]
	Rainfed upland, (Sandy loam to clay loam)	Rice (DS) - Toria/ Lentil / Wheat / Potato / Rabi vegetables / Chilli	-	- Rabi cropping with cole crops such as Cauliflower (mid season varieties – Improved japaneses, Pusa Synthetic, Pusa snowball etc.) and Cabbage (Varieties – Golden acre, Pride of india, Pusa Mukta etc.), Knolkhol (White viena) etc. - Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. --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.	Development of water harvesting structure under NREGS for life saving irrigation - Arrangements of pump sets under NFSM and RKVY -Arrangement of seed under National Horticultural Mission
		Rice (DS) / Summer vegetables - Black gram/Sesame	-Life saving supplemental irrigation -Harvesting of kharif crops at physiological maturity stage.		
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/Chilli	-		
	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 japaneses, Pusa Synthetic, Pusa snowball etc.) and Cabbage (Varieties – Golden acre, Pride of india, Pusa Mukta etc.), Knolkhol (White viena) etc. - Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices. --Growing of rabi field crops like toria, lentil,	--Development of water harvesting structure under NREGS for life saving irrigation - Arrangement of seed under National Horticultural Mission
		Jute / Rice(Kharif)-Toria / Lentil/ Wheat / Potato / Rabi			

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

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		
	Major Farming situation[f]	Normal Crop/cropping system[g]	Change in crop/cropping system[h]	Agronomic measures[i]	Remarks on Implementation[j]

Delayed release of water in canals due to low rainfall		Not applicable
Limited release of water in canals due to low rainfall		Not applicable
Non release of water in canals under delayed onset of monsoon in catchment		Not applicable

Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Not applicable
Insufficiency of surface water for irrigation	Not applicable

2.1.3 Pre monsoon flood and hailstorm under irrigated situation

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]
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	Preparation of drainage channel under MGNREGA

Condition			Suggested Contingency measures

	Major Farming situation[f]	Normal Cro[p]/cro[pp]ing s[y]stem[g]	Change in cro[p]/cro[pp]ing s[y]stem[h]	Agronomic measures[i]	Remarks on Im[p]lementation[j]
				[p]hysiolo[g]ical maturity sta[g]e.	
		Jute	Jute	- Provision for draina[g]e channel to remove excess water. - If top dressin[g] of N fertilizer is not [p]ossible, foliar s[p]ray of urea (11.5 k[g]N/ha) at 40-45 days and 55-60 days after sowin[g].,	Pre[p]aration of draina[g]e channel under MGNREGA
	1) U[p]land (sand[y] loam to clay loam)	Summer ve[g]etables	- Summer ve[g]etables - If cro[p] fails, [p]lan for rabi cro[p]s	Provision for draina[g]e channel to remove excess water.	Pre[p]aration of draina[g]e channel under MGNREGA
		Fruits (bananana, citrus etc)	-Fruits (bananana, citrus etc - if cro[p] fails, re[p]lantin[g] of cro[p]s	Provision for draina[g]e channel to remove excess water.	Pre[p]aration of draina[g]e channel under MGNREGA
	2) Flood [p]rone (sand[y] loam to clay loam)	Summer rice/ Earl[y] ahu with lon[g] duration local cultivars and hybrid rice variety	- Ado[p]tion of Short duration rice varieties like Luit, Kolon[g], dichan[g] etc in case of summer rice/ earl[y] ahu rice	-Provision for draina[g]e channel to remove excess water. - If cro[p] attains maturit[y] sta[g]e, harvest the cro[p] at [p]hysiolo[g]ical maturit[y] sta[g]e.	Pre[p]aration of draina[g]e channel under MGNREGA

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]
Hail storm under irri[g]ated	Medium / medium low /lowland land	Summer rice/ Early ahu with lon[g] duration local	Ado[p]tion of Short duration rice varieties like	-	-

Condition			Suggested	Contingency measures	
	Major Farming situation[f]	Normal Crop/croppping system[g]	Change in crop/croppping system[h]	Agronomic measures[i]	Remarks on Implementation[j]
condition	(sandy loam to clay loam)	cultivars and hybrid rice variety	Luit Kolong, Dichang etc.		
		Jute	Jute	• Growing of green manure crops like Dhaincha along the border as wind barrier.	-
	Upland (sandy loamto clay loam)	Summer vegetables	Summer vegetables/ high valued vegetable crops	• Installation of hail net • Plantation of wind break • Protected cultivation of high valued vegetable cro	-Departmental schemes like NFSM, Technology Mission, RKVY for protected cultivation.
		Fruits (bananana, citrus etc)	Mulbhoog banana cultivation	• Installation of hail net • Plantation of wind break	
	Flood prone	Summer rice/ Early ahu with long duration local cultivars and hybrid rice variety	Adoption of Short duration rice varieties like Luit Kolong, Dichang etc.	-	-

2.2 Unusual rains (untimely, unseasonal etc) (for both rain-fed and irrigated situations)

Condition	Suggested contingency measure			
Continuous high rainfal in a short span leading to water logging	Vegetative stage[k]	Flowering stage[l]	Crop maturity stage[m]	Post harvest[n]

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. -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel to avoid submergence	-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
Winter 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. -Light hoeing and weeding	Excess rain water to be drained out through surface drainage channel to avoid submergence	-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	-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	-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	- 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	-First & second earthing up at	Drainage - Make	Drainage- Make	-

	45-60 and 90-120 days after plantinᵍ, respectivelʸ. --Make trenches/furrows in between ridᵍes to facilitate drainaᵍe of excess water durinᵍ hiᵍh rainfall.	trenches/furrows in between ridᵍes to facilitate drainaᵍe of excess water durinᵍ hiᵍh rainfall.	trenches/furrows in between ridᵍes to facilitate drainaᵍe of excess water durinᵍ hiᵍh rainfall.	
Horticulture				
Chilli	-Drainaᵍe - Plant ᵖrotection measures aᵍainst anthracknose	-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. - sell 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 rainfal 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	- 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

	drained out through surface drainage channel to avoid submergence in the main field.			
Jute	- 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.	-Propping: crop should be provided mechanical support to prevent lodging - Growing of green manure crops like Dhaincha along the border as wind barrier.	-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	- Proper drainage - Provision for wind breaks	- Proper drainage - Provision for wind breaks	-Crop to be harvested at physiological maturity stage.	-proper drying
Sugarcane	-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.	-Drainage -Striping & propping	-Drainage -Striping & propping	Harvesting should be done before rain as far as possible Drying to remove excess moisture of canes
Winter 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

Horticulture				
Banana	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Drainage, Make trenches/furrows in between ridges to facilitate drainage of excess water, propping.	Shifting of the produce to drier place
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 chloropyriphos 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 chloropyriphos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module against stem borer -Spraying of pesticide should not coincide pollination 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/grains should be discarded

Winter rice	-Application of pesticides like chloropyriphos 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 chloropyriphos or Monochrotophos @ 2 ml/lit against stem borer -Adoption IPM module against stem borer -Spraying of pesticide should not coincide pollination 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/grains should be discarded
Jute	- Jute hairy caterpillar, semi looper etc. are to be hand picked and destroyed by putting in kerosinazed water. - Alternatively, apply Fenitrothion 50 Ec @ 1ml/l(3 sprayings) - In case of root rot, stem rot, seedling blight, apply carbendazim @ 1 g/l of water. Application of potash should be increased up to 50 kg/ha	-	-	-Discard insect pest and disease infested plants to maintain the quality.
Black gram	- Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying) - Against jassids, aphids, flee beetle, leaf folder, spray Malathion 50 Ec @ 2 ml/l of water. - Against damping off, root rot and seedling blight, apply carbendazim @ 1 g/l of water.	- Against YMV, spray Dimethoate @ 2ml/l (2 -3 spraying) - Against jassids, aphids, flee beetle, leaf folder, spray Malathion 50 Ec @ 2 ml/l of water.	- Against pod borer & pod bug, spray Malathion 50 Ec @ 2 ml/l of water.	Insect pest and disease infested seed/grains should be discarded
Horticulture				

Potato	-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	-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			
Transient water logging/ partial inundation[1]	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
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	-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 Vegetable	-Drainage of flood water	-Drainage of flood water	-Drainage of flood	-Harvesting of produce as
	-Hoeing in between lines for aeration in root zone after flood	-Hoeing in between lines for aeration in root zone after flood	water -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	-Raised nursery bed with 30 cm gap in between two beds so that excess water can be removed. -If seedlings are damaged by flood water, resowing may be done with the following varieties- -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. - 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's old seedling should be transplanted at 20x1 5 cm spacing with 4-5 seedlings/hill. .	-Drainage of excess water -If crop is damaged by flood, the nursery may be raised with the following varieties- - 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 20x1 5 cm spacing with 4-5 seedlings/hill. -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.	-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 - Re sowing may required if crop is damaged by flood.	-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 - 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
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		
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Cold wave				
Frost				
Hailstorm				
Cyclone				
Sand deposition or heavy siltation				
Specify crop/horticulture/plantation				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the events	During the event	After the event
Drought			
Feed and fodder availability	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. Mass awareness on feeding the livestock unconventional feeds and various byproducts. Insurance	Feeding fodders from perennial trees. Feeding already prepared silage and hay. Providing feed blocks, unconventional feeds and various byproducts. Providing urea treated straw.	Availing insurance Culling of affected and unproductive animals. Fodder rejuvination
Drinking water	Storing water in tanks for the hard period	Offering stored water to	Culling of

	Insurance	the livestock. Animals not to be exposed outside	affected and unproductive animals.
Health and disease management	Timely vaccinations against various diseases. Veterinary preparedness like storing required medicines and other accessories Mass awareness programme on management of livestock during draught. Insurance of animals	Immediate treatment of the sick animals. Conducting animal health camps during the period.	Culling of unproductive animals Availing insurance
Floods			
Feed and fodder availability	Maintenance of fodder bank in community land Silage preparation Mass awareness on feeding the livestock unconventional feeds and various byproducts. Stocking of concentrated feed in sufficient quantity. Insurance Raised plateform	Providing feed blocks, unconventional feeds and various byproducts Keep animals in safe place like raised plateform/upland	Availing insurance Culling of affected and unproductive animals. Fodder rejuvenation Health check-up and vaccination
Drinking water	Storing water in tanks Insurance	Offering stored water to the livestock.	Treating of drinking water.
Health and disease management	Timely vaccinations against various diseases. Veterinary preparedness like storing required medicines and other accessories Mass awareness programme on management of livestock during draught.	Immediate treatment of the sick animals. Conducting animal health camps during the period.	Culling of unproductive animals Availing insurance Health check-up and vaccination

Cyclone			
Feed and fodder availabilit[y]			
Drinkin[g] water			
Health and disease mana[g]ement			
Heat wave and cold wave			
Shelter/environment mana[g]ement			
Health and disease mana[g]ement			

[s] based on forewarnin[g] wherever available

2.5.2 Poultry

	Suggested contingenc[y] measures			Convergence/linkages with ongoing [p]rograms, if any
	Before the event[a]	During the event	After the event	
Drought				
Shorta[g]e of feed in[g]redients	Insurance Stora[g]e of feed	Offerin[g] stored feed	Availin[g] Insurance Cullin[g] un[p]roductive birds.	
Drinkin[g] water	Preservin[g] water in tank	Offerin[g] stored water	Cullin[g] un[p]roductive birds.	
Health and disease mana[g]ement	Timely vaccinations a[g]ainst various diseases.	Immediate treatment of the sick	Cullin[g] of un[p]roductive birds	Linka[g]es may be made with the State Animal Husbandry

	Veterinary preparedness Mass awareness programme on management of poultry during draught.	animals. Conducting animal health camps during the period.	Availing insurance	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 manag ement				
Health and disease manag ement				

[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			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/inflow	• Stop over exploitation • Restrict release of water from reservoir. • Water harvesting structure to supply water during the event	• Stop over exploitation • Fingerlings and brood fishes, if catched, to be released back to safe waters • Shift fish stock to deeper water, especially in case of pens • Drying of fish or production of value added fish products from the over harvested stock	• Re stocking, wherever possible. • D i gging of pond to increase the depth.

(i) Changes in water quality	• Thinning out of stock against reduced dissolved oxygen and space • Removal of aquatic weeds	• Proper aeration	• Remove aquatic vegetation
(i) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	• 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. • Sell out the fishes attaining marketable size to minimize loss. • 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.	• 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 basis. • Scare away birds and other animals (attracted by shallow water to catch fish) – may be vector for diseases.	• 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 of record and documents. • Paddy cum fish culture

(i) Impact of salt load build up in ponds / change in water quality	• Thinning out of stock against reduced dissolved oxygen and space	• Recirculation of water and/or aeration. • Careful observation on daily basis.	-
(i) Any other	-	-	-
2) Floods			
A. Capture			
Marine	-	-	-
Inland	• Preparation for pen and cage culture	• Pen & cage culture • Can get engaged in other related activities like net and gear making.	• Desilting & weed removal if possible
(i) No. of boats / nets/damaged			
(i) No.of houses damaged			
(i) Loss of stock			• Pen & cage culture
(iv) Changes in water quality			
(v) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	• Insurance • Repairing, turfing and compaction of peripheral embankments. • Horticulture on the embankment to prevent erosion. • Sufficient bamboo poles and nylon nets to be kept ready.	• Surround the pond with nets supported by bamboo poles to prevent escape of fish. • Supply sufficient food to fishes to reduce tendency of escaping from the pond. • •	• Desilting. • Restock the pond if original stock escapes. • Integrated fish farming • Short duration culture of species that are fast growing and can be marketed at small size. • Claim compensation with

	• ‘High stocking multiple harvesting’ can be taken up. • Sell out the fishes attaining marketable size to minimize loss. •Maintenance of proper record for claiming compen s ation, especially in schemes assisted by Govt. or financial institutes.		support of record and documents. • Removal of unwanted/ predatory fish from pond before stocking. • Paddy cum fish culture • • •
(i) Water contamination and changes in water quality (i) Health and diseases	• 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.	• Apply lime regularly as per recommendation.	• Apply lime regularly as per recommendation. • Remove muck and debris, if entered with flood. • Apply preventive agents (eg. CIFAX) before on set of winte r.
(iv) Loss of stock and inputs (feed, chemicals etc)			• After possibe repairing of the physical damage, take up late seed rearing to be stocked in the next year.
(v) Infrastructure damage (pump s, aerators, huts etc)			
(vi) Any other			• Small scale homest ead ornamental fish production, depending 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 / floodin 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) Changes in pond environment (water quality)	• Apply lime regularly as per recommendation. • Apply preventive agents (eg. CIFAX) before on set of winter.	• Apply lime regularly as per recommendation. • Restrict application of fertilizer as per requirement.	• Apply lime regularly as per recommendation.
(i) Health and Disease management			

a based on forewarnin wherever available