



भारतीय कृषि
ICAR

INDIAN COUNCIL OF
AGRICULTURAL RESEARCH

DISTRICT WISE CONTINGENCY PLAN TO DEAL WITH **EL NIÑO**

PREPAREDNESS | RESPONSE | RESILIENCE



**BUILDING A
DROUGHT RESILIENT
ASSAM**



PADDY



MAIZE



BLACK GRAM



EARLY WARNING
& MONITORING



WATER
MANAGEMENT



SUSTAINABLE
AGRICULTURE



COMMUNITY
PARTICIPATION

TOGETHER, LET'S BUILD A RESILIENT ASSAM

PREPARE TODAY • PROTECT TOMORROW • PROSPER TOGETHER

Assam

Assam is nestled in the north-eastern corner of India and it is a land of extraordinary natural abundance where agriculture has remained the foundation of life, culture, and economy for thousands of years. Agriculture plays a very important role in the socio-economic development of Assam. It is the backbone of the state's economy and holds the key to the overall development of the state. Agriculture significantly contributes to the state's economy and provides as a main source of occupation and livelihood support to the rural population of Assam. The state is blessed with abundant rainfall, fertile alluvial soils, and the vast Brahmaputra and Barak river systems, the state possesses favorable conditions for cultivating a wide range of crops.

The state is characterized by diverse agro-climatic conditions, ranging from floodplains and valleys to hilly regions, which support the cultivation of cereals, pulses, oilseeds, plantation crops, fruits, and vegetables. The major cropping seasons are *Kharif* (April–October) and *Rabi* (November–March).

Rice is the dominant crop and occupies the largest share of the cultivated area, with *Sali*, *Ahu*, and *Boro rice* being the principal rice-growing systems. Beyond rice, Assam is globally renowned for its tea industry and is the largest tea-producing state in India. The state also has significant potential for the cultivation of other crops such as maize, pulses, rapeseed-mustard, jute, sugarcane, potato, spices, fruits, medicinal plants, and organic agricultural products. Agriculture in Assam is predominantly rainfed, although irrigation facilities are gradually expanding through minor irrigation projects and groundwater development.

Horticulture also plays an important role in Assam's agricultural landscape. The state produces a rich variety of fruits and vegetables including bananas, pineapples, jackfruit, and ginger. Areca nut and betel leaf are particularly significant, both culturally and economically, and are widely cultivated across the state.

Agriculture forms the foundation of Assam's economy, supporting the livelihoods of over half of the state's population and contributing significantly to economic development. The sector is largely dominated by small and marginal farmers, with agriculture primarily practiced on fragmented and small landholdings. Despite its importance, Assam's agricultural growth is constrained by several challenges. Frequent flooding of the Brahmaputra and its tributaries causes substantial crop damage and disrupts farming activities. Soil and riverbank erosion, especially in the *char* (riverine) areas, lead to the loss of productive agricultural land. Additionally, inadequate irrigation facilities, low levels of mechanization, insufficient post-harvest infrastructure, and

limited access to modern technologies and markets restrict productivity and profitability. These factors collectively make the state's agriculture highly vulnerable to climatic and environmental stresses.

Historical impact of El Niño in Assam

Assam generally receives high annual rainfall and is less directly affected by El Niño than many parts of India. Over the decades Assam and the broader north-eastern region have experienced increasing drought vulnerability. The southwest monsoon rainfall is gradually dropped compared to the 1980s and 1990s. Strong El Niño events have historically influenced the state's rainfall distribution, temperature patterns, and agricultural productivity. El Niño often weakens the Indian summer monsoon, leading to rainfall deficits during critical crop growth stages. In Assam, this can result in delayed monsoon onset, prolonged dry spells, reduced soil moisture, and lower water availability for crops.

Major El Niño years such as 1982–83, 1987, 1997–98, 2002, 2009, 2015–16, and 2023–24 were associated with varying degrees of rainfall anomalies across Northeast India. During these periods, Assam experienced irregular monsoon rainfall, increased temperatures, and moisture stress in rainfed agricultural areas. Paddy, the state's principal crop, was particularly affected through delayed transplanting, poor tillering, and yield reductions. Horticultural crops, pulses, oilseeds, and tea plantations also faced productivity losses due to reduced rainfall and higher evapotranspiration.

Effect on Major crops

Rice (Paddy): Delayed monsoon onset and prolonged dry spells reduce nursery establishment, transplanting success, tillering, and grain filling. Yield losses have been reported during strong El Niño years such as 2002, 2009, and 2015.

Tea: Higher temperatures and reduced rainfall during El Niño periods lead to moisture stress, reduced leaf flush, lower green leaf yield, and deterioration in tea quality. Pest incidences such as red spider mite may also increase under dry conditions.

Rapeseed-Mustard: Residual soil moisture after *kharif* season is often lower in El Niño years, affecting germination, vegetative growth, and seed development, resulting in reduced yields.

Maize: Dry spells during sowing and reproductive stages can lead to poor germination, reduced plant growth, and lower grain formation. Heat stress during flowering further impacts productivity.

Pulses (Black Gram, Green Gram, Lentil, Pea): Moisture stress during flowering and pod-filling stages reduces pod formation and seed size. Delayed sowing due to irregular rainfall also affects crop duration and yield.

Jute: Reduced pre-monsoon and early monsoon rainfall during El Niño years can delay sowing and hinder early crop growth, resulting in lower fibre yield and quality.

Sugarcane: Moisture deficits during formative and grand growth stages reduce cane height, biomass accumulation, and sugar recovery. Prolonged dry conditions may lower overall cane yield.

Vegetables: High temperatures and erratic rainfall increase flower drop, poor fruit set, and pest infestations, causing significant yield reductions in tomato, brinjal, chilli, and other vegetables.

Contingency plans for major crops in Assam

Crop	Contingency Situation	Recommended Contingency Measures
Rice (Paddy)	Delayed monsoon, drought, moisture stress	Adopt short-duration and drought-tolerant varieties (Ranjit Sub-1, Bahadur Sub-1, Sahbhagi Dhan), use direct-seeded rice (DSR), undertake gap filling, practice mulching and AWD irrigation, provide life-saving irrigation.
Maize	Delayed sowing, dry spells	Use short-duration hybrids; sow with receipt of rainfall; adopt ridge-furrow planting; mulch fields; provide irrigation at tasseling and grain-filling stages; maintain optimum plant population.
Rapeseed-Mustard	Low residual soil moisture after rice harvest	Use early-maturing varieties (TS-38, M-27); timely sowing; adopt zero/minimum tillage; conserve moisture through mulching; provide protective irrigation at flowering and pod development.

Pulses (Black Gram, Green Gram, Lentil, Pea)	Moisture stress and delayed sowing	Promote short-duration varieties; utilize residual moisture; adjust sowing dates; apply seed treatment and foliar nutrition; adopt mulching and moisture conservation practices.
Jute	Deficient pre-monsoon rainfall	Use drought-tolerant varieties; delay sowing until adequate moisture is available; carry out timely thinning and weeding; apply mulches; harvest at optimum stage.
Sugarcane	Prolonged dry spells and drought	Adopt trench planting and trash mulching; use drought-tolerant varieties; schedule irrigation during critical stages; undertake earthing-up; apply organic manures.
Tea	High temperature and rainfall deficit	Apply organic mulches; maintain shade trees; construct contour trenches; harvest rainwater; provide supplemental irrigation; monitor drought-related pests and mites.
Vegetables	Moisture stress and heat waves	Shift to short-duration crops; adopt drip irrigation and mulching; raise seedlings in protected nurseries; provide irrigation during flowering and fruiting; use shade nets.
Banana	Water scarcity and prolonged dry spells	Apply basin mulching; provide supplemental irrigation; remove excess suckers; harvest rainwater in farm ponds; ensure balanced nutrient management.
Potato	Moisture deficit during planting and tuber formation	Advance sowing; adopt ridge planting and mulching; provide irrigation during tuber initiation and bulking; use short-duration varieties; maintain proper drainage.

Agriculture remains the backbone of Assam's economy and is highly dependent on the timely arrival and adequate distribution of monsoon rainfall. Although Assam generally receives abundant rainfall and is less severely affected by El Niño compared to many other regions of India, strong El Niño events can still cause significant disruptions through delayed monsoon onset, prolonged dry spells, higher temperatures, and moisture stress. These conditions adversely affect major crops such as rice, tea, maize, pulses, rapeseed-mustard, jute, sugarcane, and vegetables, leading to reduced

productivity and economic losses for farmers. Strengthening climate-resilient agriculture through the adoption of drought-tolerant varieties, efficient water management, moisture conservation practices, and crop-specific contingency measures will be essential to minimize El Niño-related risks and ensure sustainable agricultural growth and livelihood security in Assam.

Area under major crops

Crop	Area (Lakh ha)
Paddy	22.03
Maize	1.00
Black gram	0.68

Districts vulnerable to El Nino

Highly	Medium	Low
Dhima Haso, Sibsagar, Jorhat, Karimganj, Kamrup Metropolitan, Darrang, Kamrup, Sonitpur	Nalbari, Goalpara	Karbi, Anglong, Dhuburi

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	DARRANG
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1311	More than 19%	Less than 1061.91
June	426		
July	349		
August	253.8		
September	282.2		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	10490	Gross irrigated area:	32822
Net Rainfed area	82551	Gross rainfed area	117558

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	9247	31579
Wells	1243	1243
Tanks	-	-
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	50082	1004	49078
2	Jowar	-	-	
3	Maize	17461	5533	11928
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	219		219
2	Groundnut	694		694
3	Sesamum	817		817
4	SOyabean	550		550
5	Sunflower	3		3
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	1		1
2	Jute	3551		3551
3	Mesta	116		116
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	505		505
2	Tobacco	-		
3	Guar seed	-		386
4	Other Fodder crops	386		386

Crop Plan- Beginning of the season

Rainfed situation

Condition				Suggested Contingency measures	
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 week 1 st week of July	Medium land	Sali rice – rabi oilseeds/ pulses – boro rice	Rice: Satyaranjan, Basundhar	For the Sali varieties, sowing can be done up to mid or last part of July	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
		Sali rice – rabi oilseeds/ pulses	Rice: Satyaranjan, Basundhar		
		Sali rice – rabi vegetables	Rice: Satyaranjan, Basundhar		

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid Season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming Situation	Crop/ Cropping System	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Up land	Sali rice/ Sesame/ kharif blackgram/ Greengram/ Pigeonpea		Application of 2 kg urea along with manure/FYM in the field	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
			ii. Weeding iii. Thinning the plant population	i.Application of sufficient amount of organic manures before sowing ii.Balance fertilization iii.Spray of anti-transpirants iv.Mulching v.Supply of irrigation water at tillering, PI and booting stages	-
	Medium land	Sali rice		Application of 2 kg urea along with manure/FYM in the field , Supply of irrigation water at tillering, PI and booting stages	
	low land	Sali rice		Application of 2 kg urea with manure/FYM in the field, Supply of irrigation water at tillering, PI and booting stages	

Contingency measures- End of season

Condition			Suggested Contingency measures		
Terminal drought	Major Farming Situation	Crop/ Cropping System	Crop management	Rabi crop planning	Remarks on Implementation ^e

	1 Up land	Sali rice		Rabi Crop planning: Torja variety TS-36, TS-38 Potato variety Kufri Jyoti, Kufri Pokhraj can be selected Boro Rice (Joymati, Kanaklata, IRRI-8, IRRI- 28, IRRI-29) Jute variety Tarun or Nabin	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
		Sali rice/ Blackgram /Green gram/ Sesame/ Pigeon pea Cropping System: Blackgram/ Greengram/ Sesame/ Pigeonpea - Rabi crops		Rice Rabi Crop planning: Torja variety TS-36, TS-38 Potato variety Kufri Jyoti, Kufri Pokhraj can be selected Boro Rice (Joymati, Kanaklata, IRRI-8, IRRI- 28, IRRI-29) Jute variety Tarun or Nabin	
	2 Medium and Low land	Sali rice		Rice Rabi Crop planning: Torja variety TS-36, TS-38 Potato variety Kufri Jyoti, Kufri Pokhraj can be selected Boro Rice (Joymati, Kanaklata, IRRI-8, IRRI- 28, IRRI-29) Jute variety Tarun or Nabin	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.

Irrigation

Condition			Suggested Contingency measures		
Delayed /limited release of water in canals due to low rainfall	Major Farming Situation	Crop/ Cropping System	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
	Upland	Sequence cropping: Kharif pulses/oilseeds- Rabi pulses/ oilseeds	Sequence cropping: Kharif Blackgram/Green gram/Sesame- Torja/ Niger/ Linseed/Lathyrus/ Lentil	i.Mulching ii.Thinning iii.Weeding iv.Life saving irrigation	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
	Medium land	Sequence cropping: Sali rice-boro rice	Sequence cropping: Sali rice- Torja/ Niger/ Linseed/ Lathyrus, Lentil	i.Mulching ii.Thinning iii.Weeding iv.Life saving irrigation	

	Low land	Sequence cropping: Sali (winter) rice-Jute	Sequence cropping: Sali rice- Toria/ Niger/ Linseed/ Lathyrus, Lentil		
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Condition			Suggested Contingency measures		
Non-release of water in canals under delayed onset of monsoon in catchment	Major Farming Situation	Crop/ Cropping System	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
	Upland	Sequence cropping: Kharif pulses/oilseeds- Rabi pulses/ oilseeds	Sequence cropping: Kharif Blackgram/Green gram/Sesame- Toria/ Niger/ Linseed/Lathyrus/ Lentil	i. Mulching ii.Thinnin g iii.Weedi ng iv.Spray of anti-transpirants in vegetative & reproductive stages of crop growth.	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
	Medium land	Sequence cropping: Sali rice-boro rice	Sequence cropping: Sali rice- Toria/ Niger/ Linseed/ Lathyrus, Lentil	i. Mulching ii.Thinnin g iii.Weedi ng iv.Spray of anti-transpirants in vegetative & reproductive stages of crop growth.	
Condition			Suggested Contingency measures		
Lack of inflows into tank due to low rainfall	Major Farming Situation	Crop/ Cropping System	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
	Upland	Sequence cropping: Kharif pulses/oilseeds- Rabi pulses/ oilseeds	Sequence cropping: Kharif Blackgram/Green gram/Sesame- Toria/ Niger/ Linseed/Lathyrus/ Lentil	i. Mulching ii.Thinnin g iii.Weedi ng iv.Spray of anti-transpirants in vegetative & reproductive stages of crop growth.	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.

Condition			Suggested Contingency measures		
Insufficient/delayed onset of monsoon	Major Farming Situation	Crop/ Cropping System	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
	Upland	Kharif pulses/oilseeds- rabi pulses/ oilseeds	Summer pulses-rabi crops	Provide need based irrigation water.	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.

	Medium land	Sali rice, boro rice, jute, toria, wheat, lentil, pea, blackgram, green gram, rajmah/ Sali rice-boro rice	Use of Sali rice var.: Monuharsali, Andrewsali, Solpona, Prasadbhog, Gobinbhog, Sonamukhi, Luit, Kapilee, Dishang, Dikhow, Prafulla & Gitesh/ Kharif pulses/oilseeds-Boro rice & Kharif pulses/oilseeds-other rabi crops	i.Provide need based irrigation water. ii.Timely sowing of boro rice & other rabi crops-	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
		Watermelon, Apple melon, bottlegourd, bittergourd, Sweet corn, Baby corn	Use of watermelon, Apple melon, bittergourd, Sweet corn, Baby corn	Supplemental irrigation and use of OM.	

Condition			Suggested Contingency measures		
Insufficient groundwater recharge due to low rainfall	Major Farming Situation	Crop/ Cropping System	Change in Crop/ cropping system	Agronomic measures	Remarks on Implementation
	Medium land	Sequence cropping : Sali rice-Boro rice Sali rice-Rabi crops	Sequence cropping : Summer pulses-rabi crops Jute-Rabi crops Kharif pulses/oilseeds - Rabi crops	i.Adoption of micro irrigation system ii.Thinning iii.Mulching iv.Weeding v.Provide need based irrigation vi. Boro rice cultivation by SRI method	Supply of rice seeds through NFSM and other such programme Supply of weeder under RKVY.
		Watermelon, Apple melon, Bottlegourd, Bittergourd, Sweet corn, Baby corn	Use of watermelon, Apple melon, Bittergourd, Sweet corn, Baby corn	Mulching, thinning.	

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, 'Jalkund'. This water can be used for supplemental irrigation
- Augmentation of community water harvesting structures for supplemental irrigation during *khariif* season and pre-sowing irrigation during *rabi* season
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Straw mulching for moisture conservation in vegetables
- Zero tillage for moisture conservation and for cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	DHIMA HASO
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1020.1	More than 19%	Less than 826.281
June	338.1		
July	287		
August	182.1		
September	212.9		

Forecast probability for the season (as per IMD): Normal

Irrigation info:

Net irrigated area:	1025	Gross irrigated area:	1025
Net Rainfed area	41194	Gross rainfed area	55079

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1025	1025
Wells	-	-
Tanks	-	-
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	8507	1025	7482
2	Jowar	-	-	
3	Maize	4906		4906
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	400		400
2	Groundnut	5		5
3	Sesamum	1425		1425
4	SOyabean	30		30
5	Sunflower	2		2
6	Castor	32		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	53		53
2	Jute	3		3
3	Mesta	6		6
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	4282		4282
2	Tobacco	3		3
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measure		
Early season Drought (delayed onset)	Major Farming situation	Normal crop /cropping system	Change in crop /cropping system including variety	Agronomic measure	Remarks on Implementation
Delay by 4 Weeks (Specify month)*	Farming situation1: Low rainfall – Upland/ hills slope situation	Cropping system1: Autumn rice – fallow ,	No change (Crop sown during April-May is continuing crop cycle) Variety: Prang, Sok-et, Sok Jangsik, Maichu, Soksu, Sok-Ravon	1) Foliar spraying of 2% Urea 2) Spraying with anti-transpirant viz. soluble starch and PMA	
July 1 st week					
				3) Intensive weeding and mulching with weedings	

				4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Cropping system2: Autumn rice – Blackgram	No change Variety: Autumn rice: Prang, Sok-et, Sok Jangsik, Maichu, Soksu, Sok- Ravon, Blackgram: T9, farmers' variety	1)Foliar spraying of 2% Urea 2) Spraying with anti-transpirant viz. soluble starch and PMA 3) Intensive weeding and mulching with weeding 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Cropping system 3: Autumn rice- Toria	No change Variety: Autumn rice: Prang, Sok-et, Sok Jangsik, Maichu, Soksu, Sok- Ravon, Toria : M 27, TS 36, TS 38	1) Foliar spraying of 2% Urea 2) Spraying with anti-transpirant viz. soluble starch and PMA 3) Intensive weeding and mulching with weeding 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Cropping system 3: Autumn rice- Toria	No change Variety: Autumn rice: Prang, Sok-et, Sok Jangsik, Maichu, Soksu, Sok- Ravon, Toria : M 27, TS 36, TS 38	Foliar spraying of 2% Urea Spraying with anti-transpirant viz. soluble starch and PMA Intensive weeding and mulching with weeding Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Cropping system 4: Autumn rice as mixed crop with maize, sesame Maize: OPV	No change Variety: Autumn rice: Prang, Sok-et, Sok Jangsik, Maichu, Soksu, Sok- Ravon, Sesame: Farmers' variety	1) Intensive weeding and mulching with weeding 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	

		Cropping system 5:	No change	Earthing & Mulching	
		Sugarcane (Annual)	Variety: Farmers' variety	with sugarcane trash, Clipping of bottom leaves to reduce transpiration	
		Cropping system 6: Sesame – fallow	No change Variety: Farmers' variety		
		Cropping system 7: Maize – fallow Variety: OPV	No change	1) Weeding & mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Cropping system 8: Fallow – toria	No change Variety: M 27, TS 36, TS 38		
	Farming Situation 2: Low rainfall – Medium lowland situation	Cropping system 1: Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers' variety (Jabra, Araimah, Sok Palam, Daria, Barisa, Sotang)	Variety: Gitesh, Srimanta, Bharati, Gaya, Luit, Disang, Kolong, farmers' variety		
		Cropping system 2: Winter rice – toria Variety: Rice: Ranjit, Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers'	Variety: Rice: Luit, Kapili, Disang, Kolong, Haccha, Srimanta, Bharati, Gaya, farmers' variety		

Contingency measures- Mid season

Condition			Suggested Contingency measure		
Mid season (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation

At vegetative stage	Farming Situation 2: Low rainfall – Medium lowland situation	Cropping system 1: Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Pankaj, Gaya, Gitesh, farmers' variety	1) Strengthen bunds and prevent runoff 2) Delay top dressing of urea and adopt foliar spray 3) Close observation on disease pest incidence and adopt prompt remedial measures Spray 0.5- 1.0% MOP solution Spray 2.0% urea solution		
		Cropping system 2: Winter rice – Toria Variety: Sali rice: Ranjit, Bahadur, Mahsuri, Pankaj, Gaya, farmers' variety	1) Strengthen bunds and prevent runoff 2) Delay top dressing of urea and adopt foliar spray 3) Close observation on disease pest incidence and adopt prompt remedial measures Spray 0.5- 1.0% MOP solution Spray 2.0% urea solution		
		Cropping system 3: Fallow - Summer rice Variety: Ranjit, Bahadur, Mahsuri, Joymoti, Kanaklata	No change		

			Suggested Contingency measure		
Condition			Suggested Contingency measure	Rabi Crop planning	Remarks on
Terminal drought	Major Farming situation	Crop/cropping system	Crop management		
	Farming Situation 2: Low rainfall – Medium lowland situation	Cropping system 1: Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Pankaj, Gitesh, Gaya, farmers' variety	No change		
		Cropping system 2: Winter rice – Toria Variety: Sali rice: Ranjit, Bahadur, Mahsuri, Pankaj, Gitesh, Gaya, farmers' variety	No change		
		Cropping system 3: Fallow – Summer rice Variety: Ranjit, Bahadur, Mahsuri, Joymoti, Kanaklata	No change		

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Augmentation of community water harvesting structures for supplemental irrigation during *kharif* season and pre-sowing irrigation during *rabi* season
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
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- Low cost poly-house for high value vegetables cultivation in Hilly areas

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	DHUBURI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	2097	More than 19%	Less than 1698.57
June	659.9		
July	632.4		
August	397.9		
September	406.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	43261	Gross irrigated area:	43261
Net Rainfed area	35080	Gross rainfed area	140436

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	42398	42398
Tanks	-	-
Other sources	863	863

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	34930	0	
2	Jowar	-	-	
3	Maize	11841		11841
4	Bajra	-		
5	Ragi	35		35

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	85		85
2	Groundnut	350		350
3	Sesamum	454		454
4	SOyabean	-		
5	Sunflower	2		2
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	7210		7210
3	Mesta	380		380
4	Sunhemp	521		521

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	537		537
2	Tobacco	-		
3	Guar seed	-		650
4	Other Fodder crops	650		650

Crop Plan- Beginning of the season

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 4 weeks (Specify month)* Month: 1 st 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 seedling should be transplanted at 20x15 cm spacing with 4-5 seedlings/hill.	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed
				- 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 required 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 20x15 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 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	-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	- Technology showcasing programme of AAU and other seed production programmes of

				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 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 required with closer spacing (20 cm x 20 cm) and 6-8 seedlings/hill.	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 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 20x15 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 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. 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	- Technology showcasing programme of AAU and other seed production programmes of state dept of agriculture, Assam as source of seed

				grain varieties can also be done up to 1 st 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 seedlings. About 10 kg seed/ha is required with 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.	- 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 showcasing 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 seedling should be transplanted at 20x15 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.

Contingency measures- Mid season

Condition		Suggested Contingency measures			
Mid season	Major	Crop/ cropping	Change in crop/	Soil nutrient & moisture conservation measures ^d	Remarks on
drought (long dry spell, 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 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 -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/Chilli	No change		
		Rice (kharif) – Rice (summer)	No change		

	Flood prone	Summer vegetables/Jute – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli	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
		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

Contingency measures- End of season

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 viana) etc.	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.	- Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Radish etc. with recommended varieties and package of practices.	
		Summer vegetables - Toria / Lentil / Wheat / Potato / Rabi vegetables/Chilli	-	--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.	

	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 viana) 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
		Jute / Rice(Kharif)- Toria / Lentil/ Wheat / Potato / Rabi			
		vegetables/Chilli			
		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/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 viana) 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
		Rice (Late Kharif) – Toria/Lentil/ Wheat/Potato/Rabi vegetables/Chilli		--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.	

Resource management technologies (NRM Technologies)

- Low-cost rainwater harvesting technology (Jalkund) - Jalkunds are small water harvesting structures, constructed as supplementary source of irrigation water during dry spells in hilly areas.
- Desilting of community ponds improve the ground water level in wells located near the ponds. The ground water is used for the lifesaving irrigation during dry spells in kharif season and also for pre-sowing and supplemental irrigation for rabi crops.
- Recycling of desilted soil to the fields increase water holding capacity of soils as well as fertility of the soil, reduces the fertilizer requirements
- Desilting of drainage channel for quick disposal of runoff to reduce the water stagnation in low land fields –
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification.
- In situ moisture conservation in different crops through raised bed planting, Ridges and furrows to cope up with moisture stress
- Polyethylene mulching in vegetables for moisture conservation
- Straw mulching for moisture conservation in vegetables for *in situ* moisture conservation for longer periods, reduce evaporation from soil surface.
- Green manuring with Dhaincha (*Sesbania aculeata*) to enhance the crop productivity –
- Zero tillage sowing of pulses in rice fallows for moisture conservation and cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	GOALPARA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	2031.5	More than 19%	Less than 1645.515
June	595.8		
July	617		
August	385.7		
September	433		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	31328	Gross irrigated area:	31400
Net Rainfed area	41049	Gross rainfed area	100872

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	175	175
Wells	27684	27684
Tanks	-	-
Other sources	3469	3541

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	46935	100	46835
2	Jowar	-	-	
3	Maize	2118		2118
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	380		380
2	Groundnut	303		303
3	Sesamum	993		993
4	SOyabean	25		25
5	Sunflower	30		30
6	Castor	15		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	3164		3164
3	Mesta	112		112
4	Sunhemp	180		180

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	237		237
2	Tobacco	-		
3	Guar seed	-		117
4	Other Fodder crops	117		117

Crop Plan- Beginning of the season Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop/cropping system ^b	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation
Delay beyond 4 weeks (Specify month) July 1 st week	1) Farming situation: Upland	Summer vegetables/ Summer Pulse (Greengram), Sesamum	Greengram: Pratap Sesamum: Var. ST 1683, Panjub Til No. 1	Recommended package of practices for normal sowing. i) Life saving supplemental irrigation ii) Weeding at critical stages of growth. iii) Supplemental irrigation in the nursery bed of Summer vegetables iv) Addition of sufficient organic matter/compost/Vermicompost in the soil at the time of land preparation	-

		Cropping system 2: Toria/Rabi Veg /Rabi pulse (BlackGram)	No change	i) Seed treatment with Rhizobium culture i.e. Kamalabari 1 ii) Life saving supplemental irrigation iii) Weeding at critical stages of growth. iv) Addition of sufficient organic matter/compost /Vermicompost in the soil at the time of land preparation	-
		Cropping system 1: Rice(Kharif) mono cropping	No change Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404 (Shraboni), IR-36, etc (transplanting up to 1 st week of August).	-	Tender seedlings should be transplanted (SRI)
			Short duration rice varieties such as kopili, 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 first week of September viz. Manohar Sali, Andrew Sali, Salpona, Prafulla and Gitesh etc.	-	
			Traditional photosensitive coarse grain varieties can be grown up to 60 days old seedlings.	About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and higher number of seedling i.e. 6-8 seedlings/hill.	
		Rice(Kharif)- Toria/ /Potato / short duration Rabi vegetables/Chilli - Jute	No change -Growing of medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404, IR-36, Jaya etc (transplanting up to 1 st week August).	-	-

			- Short duration rice varieties such as Luit, Kopili, 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, Prafulla, Gitesh etc . and traditional photosensitive coarse grain varieties up to 60 days old seedlings.	About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	-
		Rice (kharif) – Rice (summer)	No change	- Transplanting can be done upto mid August with the following medium duration rice varieties such as Satyaranjan, Basundhara, TTB 404, IR-36, Jaya etc. Short duration rice varieties such as Luit, Kopili, 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 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. Whereas, traditional photosensitive coarse grain varieties can be grown with 60 days old seedlings. About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings/hill.	
	Flood prone	Summer vegetables/Jute – Toria/Rabi vegetables	No Change	-Recommended package of practices for normal sowing.	-
		Rice (Late Kharif) –Wheat/Rabi vegetables	No change -If there is early recession of flood water, transplanting can be done by mid August with the rice varieties like Satyaranjan, Basundhara, TTB 404, IR	Seedlings should be raised in non flood prone area.	

			-36, Jaya etc.		
			If transplanting is possible during last part of August, short duration rice varieties such as Luit, Kopili, 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, Manohar Sali, Andrew Sali, Salpona etc. and traditional photo-period sensitive coarse grain rice varieties with up to 60 days old seedlings can be grown up to last part of August.	About 60 kg seed/ha is required with closer spacing (15 cm x 15 cm) and 6-8 seedlings /hill. Community nursery may be raised in non-flood prone or high land for raising of rice seedlings.	For chronically flood affected areas, Manohar Sali, Andrew Sali, Salpona etc. and traditional photo-period sensitive coarse grain rice varieties with up to 60 days old seedlings can be grown up to last part of August.
			-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 suitable varieties such as Luit, Kolong, Dishang etc or any traditional photo period sensitive coarse grain varieties can also be done up to 1 st week of September.	Sprouted seed of 75 kg/ha is to be broadcast in puddle field.	-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 suitable varieties

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid-season drought (long dryspell, consecutive 2 weeks rainless (< 2.5 mm))	Major Farming situation	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation

At vegetative stage June 3 rd wk	1)Farming situation:.. upland	Summer vegetables/ Summer Pulse(Greengram) Toria/ Rabi Veg /Rabi pulse(Black .Gram)	No Change -Weeding at critical stages of growth. Application of post emergence herbicides - Thinning to maintain optimum plant population	-Life saving supplemental irrigation -Mulching	
	2)Farming situation:Medium	Rice(Kharif) monocropping	No Change -Top dressing of additional	- Life saving supplemental irrigation at critical stages of crop	
	land/ medium low land	Jute / Rice(Kharif)- Toria / Lentil/ / Potato / Rabi vegetables	quantities of MOP @ 37.5 kg/ha and	growth -Spraying of 2% KCl solution on leaves of rice if and when drought appears.	
		Rice (kharif) – Rice (summer)	No Change -Weeding at critical stages of growth.	-Top dressing of urea may be delayed upto heading stage of rice if drought prevails at tillering stage.	
	3.Flood prone	Summer vegetables /Jute–Toria/ Potato/ Rabi vegetables	No Change	- Supplementary life saving irrigation at critical crop stages	
		Rice (Late Kharif) – /Potato/Rabi vegetables	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	

Contingency measures- End of season

Condition		Suggested Contingency measures			
Terminal	Major	Normal	Crop management ^c	Rabi Crop planning ^d	Remarks on
drought (Early withdrawal of monsoon)	Farming situation ^a	Crop/cropping system ^b			Implementation ^e
September-October	1)Farming situation: Upland	Summer vegetables/ Summer Pulse (Green gram) Toria/Rabi Veg /Rabi pulse (Black Gram)/ Lentil	-Life saving irrigation -Harvesting of kharif crops at physiological maturity stage.	such as Cabbage, knoll-khol (mid season varieties). Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Amaranthus etc. with package of practices.	solution at flowering stage and 2% urea at pod initiation stage of pulses respectively.

				--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) Farming situation: Medium land	Rice (Kharif) monocropping	-Life saving irrigation - Harvesting of kharif crops at physiological maturity stage.	- Rabi cropping with cole crops such as Cabbage, Knol-khol (mid season varieties). -Growing of Brinjal, Tomato, potato, pea and Leafy vegetables like Amaranthus, Spinach, 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	
	3. Flood prone	Summer vegetables / Jute - Toria/Lentil/Wheat/ Potato/Rabi vegetables Rice (Late Kharif) -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, Knol-khol (mid season varieties) Growing of Tomato, Brinjal, pea, potato and Leafy vegetables like Spinach, Amaranthus etc. with recommended package of practices. --Growing of rabi field crops like toria, lentil, wheat etc. in time with pre-sowing irrigation with recommended package of practices.	

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, 'Jalkund'. This water can be used for supplemental irrigation
- Augmentation of community water harvesting structures for supplemental irrigation during *kharif* season and pre-sowing irrigation during *rabi* season
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Straw mulching for moisture conservation in vegetables
- Zero tillage for moisture conservation and for cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	JORHAT
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1281.1	More than 19%	Less than 1037.691
June	295.7		
July	369.6		
August	300		
September	315.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	3168	Gross irrigated area:	3168
Net Rainfed area	90774	Gross rainfed area	112359

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	486	486
Wells	2682	2682
Tanks	-	-
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	68992	805	68187
2	Jowar	-	-	
3	Maize	153		153
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	14		14
2	Groundnut	420		420
3	Sesamum	72		72
4	SOyabean	300		300
5	Sunflower	-		
6	Castor	14		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	8		8
2	Jute	9		9
3	Mesta	9		9
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	30		30
2	Tobacco	1		1
3	Guar seed	-		125
4	Other Fodder crops	125		125

Crop Plan- Beginning of the season Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks	Medium and Low Land (High rainfall,	Rice	No change	Irrigate the seedbed and nursery raising in	Collaboration with TM for Hort crop, RKVY

Contingency measures- Mid season

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation

At vegetative stage	1. Medium and Low Land (High rainfall, loamy sandy loam soil, acidic soil) 2. Upland(High rainfall, loamy, sandy loam soil, acidic soil) 3. Hill slope(High rainfall, sandy loam soil, slightly eroded acidic soil)	Kharif vegetables- winter Rice Winter Rice-rapeseed Winter Rice-summer Rice Kharif vegetables- Rabi Vegetables Autumn rice(Direct seeded)- Vegetable Fruits-Vegetables	Harvesting of vegetables at physiological maturity, Weeding, Thinning of population.	Avoid application of remaining split dose of fertilizer, Spray of antitranspitint.	
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Contingency measures- End of season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
	1. Medium and Low Land (High rainfall, loamy sandy loam soil, acidic soil)	Kharif vegetables-winter Rice Winter Rice-rapeseed Winter Rice-summer Rice	Harvesting of vegetables at physiological maturity, Weeding, Thinning of population. Prepare land for rabi crop	Avoid application of remaining split dose of fertilizer, Spray of antitranspitint.	
	2. Upland(High rainfall, loamy, sandy loam soil, acidic soil)	Kharif vegetables- Rabi vegetables Autumn rice(Direct seeded)- Vegetable			
	3. Hill slope(High rainfall, sandy loam soil, slightly eroded acidic soil)	Fruits-Vegetables			

Resource management technologies (NRM Technologies)

- Low-cost rainwater harvesting technology (Jalkund) - Jalkunds are small water harvesting structures, constructed as supplementary source of irrigation water during dry spells in hilly areas.
- Desilting of community ponds also help to improve the ground water level in wells located near the ponds. The ground water can be used for the lifesaving irrigation during dry spells in kharif season and also for pre-sowing and supplemental irrigation for rabi crops.
- Recycling of desilted soil to the fields increase water holding capacity of soils as well as fertility of the soil, reduces the fertilizer requirements
- Desilting of drainage channel for quick disposal of runoff to reduce the water stagnation in low land fields –

- Artificial ground water recharge pits for ground water augmentation and for cropping intensification.
- In situ moisture conservation in different crops through raised bed planting, Ridges and furrows to cope up with moisture stress
- Polyethylene mulching in vegetables for moisture conservation
- Straw mulching for moisture conservation in vegetables for *in situ* moisture conservation for longer periods, reduce evaporation from soil surface.
- Green manuring with Dhaincha (*Sesbania aculeata*) to enhance the crop productivity
- Zero tillage sowing of pulses in rice fallows for moisture conservation and cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	KAMRUP
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1292.7	More than 19%	Less than 1047.087
June	387.4		
July	371.7		
August	271		
September	262.6		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	12060	Gross irrigated area:	16109
Net Rainfed area	93740	Gross rainfed area	166397

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1618	2476
Wells	6344	8789
Tanks	729	1110
Other sources	3369	3734

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	79385	3561	75824
2	Jowar	-	-	
3	Maize	5199	9	5190
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	298		298
2	Groundnut	30		30
3	Sesamum	938	31	907
4	SOyabean	110		110
5	Sunflower	-		
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	1		1
2	Jute	5316		5316
3	Mesta	67		67
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	571		571
2	Tobacco	-		
3	Guar seed	-		937
4	Other Fodder crops	1000	63	937

Condition	Suggested Contingency measures				
Early season Drought (delayed onset)	Major Farming Situation*	Crop/cropping system*	Change in crop/cropping System*	Agronomic Measures*	Remarks on Implementation*
Delay by 4 Weeks(Specify Monthly) July 1st week	Rainfed upland (Sandy loam to clay loam)	Summer vegetables/ Blackgram/Sesame (kharif) - Toria/ /Potato/Rabi vegetables	No change	➤ As per normal package of practices	-Lift irrigation from nearby river stream
		Banana (plantation) Dwarf cavendish, Borjahji, Malbhog	No change	➤ Use of bio mulching	Community bund on tributaries for diversion of water flow to crop field
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Jute/Sali Rice-Toria/Lentil/ Wheat/Potato/Rabi vegetables	No change	➤ Growing of medium duration rice varieties ➤ Supplemental irrigation in the nursery bed of rice. ➤ Growing of short duration vegetables	-Mega seed production programme for field crops

		Ahu rice -Fallow-Rabi vegetable/potato/toria	No change	➤ Growing of short duration ahu rice variety like Luit ➤ Early sowing of rabi crop for efficient utilization of residual soil moisture.	
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Rainfed upland (Sandy loam to clay loam)	Summer vegetables/ Blackgram/Sesame (kharif) - Toria/ /Potato/Rabi vegetables	➤ Life saving supplemental irrigation ➤ Weeding at critical stages of growth.	➤ Application of sufficient quantity of FYM or compost in the main field. ➤ Top dressing of additional quantity of K fertilizer in rice. ➤ Mulching, Conservation furrows	Community bund on tributaries for diversion of water flow to crop field
		Banana/citrus/pineapple	➤ Lifesaving supplemental irrigation	➤ Mulching, Conservation furrows ➤ Intercropping of vegetables in new plantation ➤ Drip irrigation	
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Jute/Sali Rice-Toria/Lentil/ Wheat/Potato/Rabi vegetables	Weeding at critical stages of growth	➤ Green manuring practice during summer ➤ Prepare dry, well bunded, flat seedbed with adequate FYM(30 kg), ➤ Spraying of 2% KCL solution on leaves of rice ➤ Top dressing of additional quantity of K fertilizer in rice ➤ Application of insecticides against thrips in nursery bed of rice	
		Ahu rice -Fallow-Rabi vegetable/potato/toria	-	➤ Application of sufficient quantity of FYM or compost in the nursery bed and main field ➤ Urgent irrigation, Weeding, Thinning of population ➤ Spraying of 2% KCL solution on leaves of rice if and when drought appears ➤ Top dressing of additional quantity of K fertilizer in rice	

		Fallow-Sali Rice -Fallow	-	➤ 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 ➤ Top dressing of urea may be delayed upto heading stage of rice if drought prevails at the stages of top dressing ➤ Life saving supplemental irrigation at critical stages of crop growth ➤ Application of insecticides against thrips in nursery bed of rice	
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Mid season drought (long dry spell) At reproductive stage	Rainfed upland (Sandy loam to clay loam)	Summer vegetables/ Blackgram/Sesame (kharif) - Toria/ /Potato/Rabi vegetables	➤ Life saving supplemental irrigation ➤ Harvesting at physiological maturity	➤ Life saving supplemental irrigation ➤ Weeding at critical stages of growth. ➤ Application of sufficient quantity of FYM or compost in the main field. ➤ Top dressing of additional quantity of K fertilizer in rice. ➤ Mulching, Conservation furrows	Community bund on tributaries for diversion of water flow to crop field
		Banana /pineapple/citrus	-	➤ Use of black poly mulch ➤ Mulching, Conservation furrows ➤ Intercropping of vegetables in ne plantation ➤ Drip irrigation	
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Jute/Sali Rice-Toria/Lentil/ Wheat/Potato/Rabi vegetables	-	➤ Green manuring practice during summer ➤ Prepare dry, well bunded, flat seedbed with adequate FYM(30 kg), 80g urea, 80g SSP and 80g ➤ Spraying of 2% KCL solution on leaves of rice if and when drought appears ➤ Top dressing of additional quantity of K fertilizer in rice	

		Ahu rice -Fallow-Rabi vegetable/potato/toria	-	➤ Application of sufficient quantity of FYM or compost in the nursery bed and main field ➤ Urgent irrigation, Weeding, Thinning of population ➤ Spraying of 2% KCL solution on leaves of rice if and when drought appears ➤ Top dressing of additional quantity of K fertilizer in rice	
		Fallow-Sali Rice -Fallow	Fallow-Sali rice- Rapeseed/pea	➤ 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 ➤ Life saving supplemental irrigation at critical stages of crop growth	
		Ahu rice-Fallow-Toria/Potato/rabi vegetable	-	➤ Green manuring practice during summer ➤ Application of sufficient quantity of FYM or compost in the nursery bed and main field.	
	Terminal drought	Rainfed upland (Sandy loam to clay loam)	Summer vegetables/ Blackgram/Sesame (kharif) - Toria/ /Potato/Rabi vegetables	➤ Summer vegetable- Green manuring- rabi vegetable/toria/potato ➤ Application of sufficient quantity of FYM or compost in the main field. ➤ Early rabi cropping ➤ Growing of rabi field crops like toria, lentil, wheat in time with presowing irrigation if required	
			Banana /citrus/pineapple	➤ Mulching, Conservation furrows ➤ Intercropping with rabi vegetable in new plantation ➤ Drip irrigation	
	Rainfed medium/medium lowland (Sandy loam to clay loam)	Jute/Sali Rice-Toria/Lentil/ Wheat/Potato/Rabi vegetables	-	➤ Growing of rabi vegetables like Cabbage, Cauliflower, Knolkhol, Tomato, Brinjal, Pea, Carrot etc. ➤ Growing of rabi field crops like toria, lentil, wheat in time with presowing irrigation if required.	
		Ahu rice -Fallow-Rabi vegetable/potato/toria	-	➤ Application of sufficient quantity of FYM or compost in the nursery bed and main field	
		Fallow-Sali Rice -Fallow	Fallow-Sali rice- Rapeseed/pea	➤ Growing of rabi vegetables like Cabbage, Cauliflower, Knolkhol, Tomato, Brinjal, Pea, Carrot etc. ➤ Growing of rabi field crops like toria, lentil, wheat in time with presowing irrigation if required.	

Drought - Irrigated situation					
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	NA				
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	NA		NA		
Insufficiency of surface water for irrigation	NA				
Insufficient groundwater Recharge due to low rainfall	NA				

Resource conservation measures

Medium risk prone districts-Kamrup

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Augmentation of community water harvesting structures for supplemental irrigation during *khari*f season and pre-sowing irrigation during *rabi* season
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC , this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Straw mulching for moisture conservation in vegetables
- Zero tillage for moisture conservation and for cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas
- Strip cropping of pineapple with broom grass for minimising erosion and soil loss.

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	KARBI ANGLONG
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	889.4	More than 19%	Less than 720.414
June	220.2		
July	236.5		
August	201.8		
September	230.9		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	44858	Gross irrigated area:	49319
Net Rainfed area	44376	Gross rainfed area	83150

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	42572	46688
Wells	2286	2631
Tanks	-	-
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	66274	34442	31832
2	Jowar	-	-	
3	Maize	9771	156	9615
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	484		484
2	Groundnut	-		
3	Sesamum	1593		1593
4	SOyabean	-		
5	Sunflower	-		
6	Castor	219		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	394		394
2	Jute	485		485
3	Mesta	150		150
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	2910	85	2825
2	Tobacco	24		24
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation	Crop/ Cropping system	Change in crop cropping system	Agronomic measures	Remarks on implementation
Delay by 4 Weeks (Specify month)*July 1 st week	Farming situation1: Low rainfall – Upland/ hills slope situation (Sandy Loam to clay loam)	Autumn rice – fallow Variety: Inghlongkiri, Maibee, Dimro, farmers' variety	No change	1) Foliar spraying of 2% Urea 2) Spraying with anti-transpirant viz. soluble starch and PMA 3) Intensive weeding and mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	

		Autumn rice – Blackgram Variety: Autumn rice: Inghlongkiri, Maibee, Dimro, farmers’ variety Blackgram: T9, farmers’ variety	No change	1)Foliar spraying of 2% Urea 2)Spraying with anti- transpirant viz. soluble starch and PMA 3) Intensive weeding and mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Autumn rice- Toria Variety: Autumn rice: Inghlongkiri, Maibee, Dimro, farmers’ variety Toria : M 27	No change	1) Foliar spraying of 2% Urea 2)Spraying with anti- transpirant viz. soluble starch and PMA 3) Intensive weeding and mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Autumn rice as mixed crop with maize, sesame Variety: Autumn rice: Inghlongkiri, Maibee, Dimro, farmers’ variety Sesame: Farmers’ variety Maize: OPV	No change	1)Intensive weeding and mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Sugarcane (Annual) Variety: Farmers’ variety	No change	Earthing & Mulching with sugarcane trash	
		Sesame – fallow Variety: Farmers’ variety	No change	No change	
		Maize – fallow Variety: OPV	No change	1)Weeding & mulching with weedings 4) Close observation on disease like Blast and pest like stem borer, thrips etc. for effective control	
		Fallow – toria Variety: M 27	No change	No change	
	Farming Situation 2: Low rainfall – Medium lowland situation(Sandy Loam to clay loam)	Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers’ variety	Variety: Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers’ variety	No change	
		Winter rice – toria Variety: Rice: Ranjit, Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers’ variety Toria: TS 36, TS 38	Variety: Rice: Bahadur, Mahsuri, Srimanta, Bharati, Gaya, farmers’ variety	No change	
		Fallow - Summer rice	No change	No change	
Mid season (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Low rainfall – Medium lowland situation (Sandy Loam to clay loam)	Cropping system 1: Winter rice – fallow	1) Strengthen bunds and prevent runoff	1) Spray 0.5-1.0% MOP solution 2) Spray 2.0% urea solution	

		Variety: Ranjit, Bahadur, Mahsuri, Monohar Sali, Gaya, farmers' variety	2) Delay top dressing of urea and adopt 3) Close observation on disease pest incidence and adopt prompt remedial measures		
		Cropping system 2: Winter rice –Torla Variety: Sali rice: Ranjit, Bahadur, Mahsuri, Gaya, farmers' variety	1) Strengthen bunds and prevent runoff 2) Delay top dressing of urea and adopt 3) Close observation on disease pest incidence and adopt prompt remedial measures	1) Spray 0.5-1.0% MOP solution 2) Spray 2.0% urea solution	
		Cropping system 3: Fallow - Summer rice Variety: Ranjit, Bahadur, Mahsuri	-	-	
Mid season drought (long dry spell)					
At reproductive stage	Farming Situation 2: Low rainfall – Medium lowland situation (Sandy Loam to clay loam)	Cropping system 1: Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Monohar Sali, Gaya, farmers' variety	1) Strengthen bunds and prevent runoff 2) Close observation on disease pest incidence and adopt prompt remedial measures	Life saving irrigation from near by water sources	
		Cropping system 2: Winter rice –Torla Variety: Sali rice: Ranjit, Bahadur, Mahsuri, Gaya, farmers' variety	1) Strengthen bunds and prevent runoff 2) Close observation on disease pest incidence and adopt prompt remedial measures	Life saving irrigation from nearby water sources	
		Cropping system 3: Fallow - Summer rice Variety: Ranjit, Bahadur, Mahsuri,	-	-	
Terminal drought (Early withdrawal of monsoon)					
Terminal drought	Farming Situation 2: Low rainfall – Medium lowland situation (Sandy Loam to clay loam)	Cropping system 1: Winter rice – fallow Variety: Ranjit, Bahadur, Mahsuri, Monohar Sali, Gaya, farmers' variety	No change	No change	

		Cropping system 2: Winter rice –Toria Variety: Sali rice: Ranjit, Bahadur, Mahsuri, Gaya, farmers’ variety	No change	No change	
		Cropping system 3: Fallow - Summer rice Variety: Ranjit, Bahadur, Mahsuri,	No change	No change	

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Augmentation of community water harvesting structures for supplemental irrigation during *kharif* season and pre-sowing irrigation during *rabi* season
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC , this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Straw mulching for moisture conservation in vegetables
- Zero tillage for moisture conservation and for cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas
- SRI technology in summer rice for enhancing rice yield with limited water.
- Strip cropping of pineapple with broom grass for minimising erosion and soil loss.

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	KARIMGANJ
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	2155.3	More than 19%	Less than 1745.793
June	645.1		
July	589.4		
August	479.8		
September	441		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	3189	Gross irrigated area:	3312
Net Rainfed area	69525	Gross rainfed area	87072

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1635	1667
Wells	1320	1379
Tanks	-	-
Other sources	234	266

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	59885	1927	57958
2	Jowar	-	-	
3	Maize	340		340
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	60		60
2	Groundnut	15		15
3	Sesamum	14		14
4	SOyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	8		8
2	Jute	52		52
3	Mesta	-		
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	131		131
2	Tobacco	-		
3	Guar seed	-		
4	Other Fodder crops	-		

Crop Plan- Beginning of the season Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation	Crop/ Cropping system	Change in crop cropping system	Agronomic measures	Remarks on implementation

Delay by 4 weeks July 1st week	Erratic rainfall shallow dark grey to brown soils (low land) & Deep dark grey to brown soils (Up & Medium land)	Sali rice (Mono crop-Low & medium land) Sali rice: Pankaj, Lakhimi, Manoharsali, Andrewsali, Prafulla, Gitesh. Glutinous rice: Gandhi Biroin (local). Scented rice: Badshabhog.	No change in crop/cropping system	Preparation of seed bed & main field immediately after rainfall. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc. Irrigate only 2-3 days after recession of ponded water. Care should be taken that cracks do not appear in the field. Divert some area from paddy to pulses and oil seeds in medium land. Keep constant visit in the field to check any cracks & crevices and take immediate measures by repairing/ mud plastering. Number of seedlings per hill be increased to 4 – 5 with closer spacing of 15 cm x 10 cm. Use suitable short duration rice varieties either for direct sowing/transplanting. Grow seedlings accordingly. Apply whole of the fertilizers at the time of sowing/transplanting unlike normal condition. Topdress additional dose of 2-3 kg MOP per bigha in case of acute drought.	Supply of seeds through National Calamity relief fund, National disaster management fund. Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, LLP under RKVY.
		Sali rice - Oil seeds/pulses (medium land) For Sali rice Same as cropping system-1. Rapeseed: TS-36, TS-38, TS-29, M-27. Linseed: T-397 & local. Sesamum: Madhavi, Gouri, Vinayak, Punjab tall No.1, RT-1. Pulses: Rajmah (Local, Uday, PDR-14), Pea (Azad P-1, T-163, Boneville, Local), Black gram (Local, T-9, T-27, KU-309).	No change in crop/cropping system	For Sali rice Same as cropping system-1. Early sowing of rapeseed. Soil & moisture conservation measures (Organic mulches + more FYM). Timely land preparation & sowing. Seed soaking for toria. Weeding & breaking of soil mulch by finger weeder. Ridge & furrow cultivation of Rajmah. Grow short duration pulses (Black gram, Rajmah, Pea etc.). Utilization of waters for irrigation from nearby beels, ponds, rivers, natural depressions etc. Soil compaction wherever possible.	Same as Cropping system-1. Supply of Finger weeder under RKVY. Supply of Water pumps, STW, LLP under RKVY.

		Sali rice-Winter vegetables(medium land) For Sali rice Same as cropping system-1. Winter Vegetables: Cabbage: Drum head, Pride of India, Golden acre. Cauliflower: Snowball-16, Pusa snowball, Pusa Deepali (Early).Tomato: Arka Alok, Suraksha (Hybrid), Pusa ruby, local.Brinjal: JC-1, Pusa purple round, Pusa purple long, Pusa Kranti, Longai (Local). Chilli: Pusa Jwala, Krishna, local. Coriander: UP 41, Pusa 860, local selection. Spinach: All green, Pusa Jyoti, local. Dolichus bean: Pusa early profile, HD-18, local. Potato: Kufri chandramukhi, Kufri Jyoti, Kufri sindhuri.Pumpkin: Local. Amaranthas: Local. Cow pea: Pusa Barsati, local.	No change in crop/cropping system	For Sali rice Same as cropping system-1. Grow important early winter vegetables. Timely land preparation & sowing. Soil & Moisture conservation measures (Organic mulches + more FYM).Ridge & furrow cultivation. Utilization of waters for irrigation from nearby <i>beels</i>, ponds, rivers, natural depressions etc. Pitcher pot irrigation may be followed wherever possible.	Same as Cropping system-1. Supply of Water pumps, STW, LLP under RKVY.
		Sali rice-Boro rice(low land) For Sali rice Same as cropping system-1. Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad,IR-68.	No change in crop/cropping system	For Sali rice Same as cropping system-1. Timely land preparation, sowing & Transplanting. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby <i>beels</i>, ponds, rivers, natural depressions etc. Preferably short duration HYV may be sown.	Same as Cropping system-1.
		Sali rice-ahu rice(low & medium land) For Sali rice Same as cropping system-1. Ahu rice (Transplanted): Luit, Disang, Krishna, Gopinath, Jaya, Cauvery, IR-36, IR-50, Ratna, Culture-1, Soket-4. Ahu rice (Direct seeded): Koimurali. Luit.	No change in crop/cropping system	Timely land preparation, sowing & transplanting. Integrated weed management. Rain water harvesting by 30 cm high bunding. Utilization of waters for irrigation from nearby <i>beels</i>, ponds, rivers, natural depressions etc.Use of Drum seeder.	Same as Cropping system-1. Supply of Water pumps, Drum seeder, STW LLP under RKVY.
		Fallow - Boro rice(Typical low land) For Boro rice Same as cropping system-4.	No change in crop/cropping system	For Boro rice Same as cropping system-4.	Same as Cropping system-1.
		Summer vegetables - Winter vegetables (River bank, up land & medium land)	No change in crop/cropping system	Timely sowing & planting. Pitcher pot irrigation (conventional drip irrigation).Ensure stand	Same as Cropping system-1.Supply o

		Summer Vegetables: Okra (Prabhani Kranti, Pusa Sawani, Arka anamika, local). Cucumber (Chinese green, Pusa sanyog, Poinsette, AAUC-1, AAUC-2, AAUC-3, AAUC-4, local). Ridge gourd (Pusa Nasdar, AAUJ-2, AAUJ-3, local). Bitter gourd (For spring season-Pusa Do Mausmi, Long green, local, Extra long. For summer-Monsoon monarch, Long green monsoon, Coimbatore long). Bottle gourd: Pusa summer prolific long, Pusa summer prolific round, local. Snake gourd: Long green, Long white, Extra long, local. Winter Vegetables: Same as Cropping System-3.		establishment. Soil & Moisture conservation measures (Organic mulches + more FYM). Ridge & furrow cultivation. Utilization of waters for irrigation from nearby <i>beels</i> , ponds, rivers, natural depressions etc. For Winter Vegetables: Same as Cropping System-3.	Water pumps, STW, LLP under RKVY.
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Abundant & erratic rainfall shallow dark grey to brown soils (low land) & Deep dark grey to brown soils (Up & Medium land)	Sali rice (Mono crop-Low & medium land) Sali rice: Ranjit, Bahadur, Pankaj, Kushal, Moniram. Glutinous rice: Gandhi Biroin (local). Scented rice : Badshabhog.	1. Re-sowing with short duration variety, seeds should be treated with 4 % MOP for 24 hours & dry in shade for 24 hours. 2. Mat Nursery technique to meet the shortage of seedlings. 3. Life saving irrigation. 4. Direct seeding of short duration late variety (Luit, Disang etc.) 5. Timely weed control measures (IWM).	1. Top dressing of N as it rains, P & K as top dressing in line sowing crop, Apply P upto 3 weeks after seeding & K up to flowering. 2. Large Scale utilization of organic mulches & FYM. 3. Rain water harvesting by 30 cm high bunding. 4. Weeding & breaking of soil mulch by finger weeder. 5. Top dress additional quantities of MOP @ 5 kg/bigha & incorporate it. 6. Spray 2% KET solution on leaves. 7. Top dressing of Urea may be delayed upto heading stage.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme.
		Sali rice - Oil seeds/pulses (medium land) Cropping System:1 For Sali rice Same as cropping system-1. Rapeseed: TS-36, TS-38, TS-29, M-27. Linseed: T-397 & local. Sesamum: Madhavi, Gouri, Vinayak, Punjab tall No.1, RT-1. Pulses: Rajmah (Local, Uday, PDR-14), Pea (Azad	1. Resowing with short duration variety, For Sali rice seeds should be treated with 4 % MOP for 24 hours & dry in shade for 24 hours, For toria the seeds should be soaked.	1. For Sali rice Top dressing of N as it rains, P & K as top dressing in line showing crop, Apply P upto 3 weeks after seeding & K up to flowering. 4. Large Scale utilization of organic mulches & FYM. 5. For Sali rice, rain water harvesting by 30 cm high bunding.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder

		P-1, T-163, Boneville, Local), Black gram (Local, T-9, T-27, KU-309).	2. For Sali rice the Mat Nursery technique to meet the shortage of seedlings. 3. Life saving irrigation. 4. Direct seeding of short duration late Sali rice variety (Luit, Disang etc.) 5. Timely weed control measures (IWM). 6. Divert some area from paddy to pulses & oilseeds.	6. Weeding & breaking of soil mulch by finger weeder. 7. Ridge & furrow cultivation of Rajmah. 8. For Sali rice: Top dress additional quantities of MOP @ 5 kg/bigha & incorporate it, Spray 2% KET solution on leaves, top dressing of Urea may be delayed upto heading stage.	LLP under RKVY/Govt Scheme.
		Sali rice-Winter vegetables (medium land) For Sali rice Same as cropping system-1. Winter Vegetables: Cabbage: Drum head, Pride of India, Golden acre. Cauliflower: Snowball-16, Pusa snowball, Pusa Deepali (Early). Tomato: Arka Alok, Suraksha (Hybrid), Pusa ruby, local. Brinjal: JC-1, Pusa purple round, Pusa purple long, Pusa Kranti, Longai (Local). Chilli: Pusa Jwala, Krishna, local. Coriander: UP 41, Pusa 860, local selection. Spinach: All green, Pusa Jyoti, local. Dolichus bean: Pusa early profile, HD-18, local. Potato: Kufri chandramukhi, Kufri Jyoti, Kufri sindhuri. Pumpkin: Local. Amaranthas: Local. Cow pea: Pusa Barsati, local.	1. Same as cropping system-1 for Sali Rice. 2. Divert some area from paddy to early winter vegetables.	1. Same as cropping system-1 for Sali Rice. 2. Ridge & furrow cultivation of vegetables.	Same as cropping system-1 for Sali Rice.
		Sali rice-Boro rice(low land) For Sali rice Same as cropping system-1. Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad, IR-68.	Same as cropping system-1 for Sali Rice	Same as cropping system-1 for Sali Rice	Same as cropping system-1 for Sali Rice

		Sali rice-ahu rice(low & medium land) For Sali rice Same as cropping system-1. Ahu rice (Transplanted): Luit, Disang, Krishna, Gopinath, Jaya, Cauvery, IR-36, IR-50, Ratna, Culture-1, Soket-4. Ahu rice (Direct seeded): Koimurali. Luit.	Same as cropping system-1	Same as cropping system-1	Same as cropping system-1
		Fallow - Boro rice(Typical low land) Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad,IR-68.	Not applicable	Not applicable	Not applicable
		Summer vegetables - Winter vegetables (River bank, up land & medium land). Summer vegetables: Okra (Prabhani Kranti, Pusa Sawani, Arka anamika, local). Cucumber (Chinese green, Pusa sanyog, Poinsette, AAUC-1, AAUC-2, AAUC-3, AAUC-4, local). Ridge gourd (Pusa Nasdar, AAUC-2, AAUC-3, local). Bitter gourd (For spring season-Pusa Do Mausmi, Long green, local, Extra long. For summer-Monsoon monarch, Long green monsoon, Coimbatore long). Bottle gourd: Pusa summer prolific long, Pusa summer prolific round, local. Snake gourd: Long green, Long white, Extra long, local. Winter Vegetables: Same as Cropping System-3.	1. Thinning and gap filling the existing crop. 2. Resowing with short duration variety. 3. Divert some area to early winter vegetables. 4. Timely weed control measures (IWM).	1. Large Scale utilization of organic mulches & FYM. 2. Rain water harvesting. 3. Weeding & breaking of soil mulch by finger weeder. 4. Ridge & furrow cultivation. 5. Apply N as top dress as it rains, P & K also as top dress if not applied as basal in line seeded crop. 6. P should be applied up to 3 weeks after seeding & K upto flowering.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW,finger weeder LLP under RKVY/Govt Scheme.
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Abundant & erratic rainfall shallow dark grey to brown soils (low land) & Deep dark grey to brown soils(Up & Medium land)	Sali rice (Mono crop-Low & medium land) Sali rice: Ranjit, Bahadur, Pankaj, Kushal, Moniram. Glutinous rice: Gandhi Biroin (local). Scented rice :Badshahbhog.	1. Life saving irrigation. 2. Direct seeding of short duration late variety (Luit, Disang etc.) 3. Timely weed control measures (IWM) & weed mulching	1. Apply K up to flowering. 2. Large Scale utilization of organic mulches & FYM. 3. Rain water harvesting by 30 cm high bunding. 4. Weeding & breaking of soil mulch by finger weeder. 5. Top dress additional quantities of MOP @ 5 kg/bigha & incorporate it. 6. Spray 2% KET solution on leaves.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW,finger weeder LLP under RKVY/Govt Scheme.

				7. Top dressing of Urea may be delayed upto heading stage.	
		Sali rice - Oil seeds/pulses (medium land) For Sali rice Same as cropping system-1. Rapeseed: TS-36, TS-38, TS-29, M-27.Linseed: T-397 & local. Sesamum: Madhavi, Gouri, Vinayak, Punjab tall No.1, RT-1.Pulses: Rajmah (Local, Uday, PDR-14), Pea (Azad P-1, T-163, Boneville, Local), Black gram (Local, T-9, T-27, KU-309).	1. For toria the seeds should be soaked. 2. Life saving irrigation. 3. Direct seeding of short duration late Sali rice variety (Luit, Disang etc.) 5. Timely weed control measures (IWM) & weed mulching. 6. Divert some area from paddy to pulses & oilseeds.	1. Apply K up to flowering. 2. Large Scale utilization of organic mulches & FYM. 3. For Sali rice, rain water harvesting by 30 cm high bunding. 4. Weeding & breaking of soil mulch by finger weeder. 5. Ridge & furrow cultivation of Rajmah. 6. For Sali rice: Top dress additional quantities of MOP @ 5 kg/bigha & incorporate it, Spray 2% KET solution on leaves, top dressing of Urea may be delayed upto heading stage.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme.
		Sali rice-Winter vegetables (medium land) For Sali rice Same as cropping system-1. Winter Vegetables: Cabbage: Drum head, Pride of India, Golden acre. Cauliflower: Snowball-16, Pusa snowball, Pusa Deepali (Early).Tomato: Arka Alok, Suraksha (Hybrid), Pusa ruby, local.Brinjal: JC-1, Pusa purple round, Pusa purple long, Pusa Kranti, Longai (Local). Chilli: Pusa Jwala, Krishna, local. Coriander: UP 41, Pusa 860, local selection. Spinach: All green, Pusa Jyoti, local. Dolichus bean: Pusa early profile, HD-18, local. Potato: Kufri chandramukhi, Kufri Jyoti, Kufri sindhuri.Pumpkin: Local. Amaranthas: Local. Cow pea: Pusa Barsati, local.	1. Same as cropping system-1 for Sali Rice. 2. Divert some area from paddy to early winter vegetables.	1. Same as cropping system-1 for Sali Rice. 2. Ridge & furrow cultivation of vegetables.	Same as cropping system-1 for Sali Rice.
		Sali rice-Boro rice (low land) For Sali rice Same as cropping system-1. Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad, IR-68.	Same as cropping system-1 for Sali Rice	Same as cropping system-1 for Sali Rice	Same as cropping system-1 for Sali Rice

		Sali rice-ahu rice(low & medium land) For Sali rice Same as cropping system-1. Ahu rice (Transplanted): Luit, Disang, Krishna, Gopinath, Jaya, Cauvery, IR-36, IR-50, Ratna, Culture-1, Soket-4. Ahu rice (Direct seeded): Koimurali. Luit.	1. Same as cropping system-1. 2. Divert some area for early ahu rice. 3. Timely land preparation and sowing of ahu rice.	Same as cropping system-1	Same as cropping system-1
		Fallow - Boro rice(Typical low land) Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad,IR-68.	Not applicable	Not applicable	Not applicable
		Summer vegetables - Winter vegetables (River bank, up land & medium land). Summer vegetables: Okra (Prabhani Kranti, Pusa Sawani, Arka anamika, local).Cucumber (Chinese green, Pusa sanyog, Poinsette, AAUC-1, AAUC-2, AAUC-3, AAUC-4, local).Ridge gourd (Pusa Nasdar, AAUC-2, AAUC-3, local).Bitter gourd (For spring season-Pusa Do Mausmi, Long green, local, Extra long. For summer-Monsoon monarch, Long green monsoon, Coimbatore long).Bottle gourd: Pusa summer prolific long, Pusa summer prolific round, local.Snake gourd: Long green, Long white, Extra long, local. Winter Vegetables: Same as Cropping System-3.	1. Thinning and gap filling the existing crop. 2. Resowing with short duration variety. 3. Divert some area for early winter vegetables. 4. Timely weed control measures (IWM) & weed mulching.	1. Large Scale utilization of organic mulches & FYM. 2. Rain water harvesting. 3. Weeding & breaking of soil mulch by finger weeder. 4. Ridge & furrow cultivation. 5. Apply N as top dress as it rains, P & K also as top dress if not applied as basal in line seeded crop. 6. P should be applied up to 3 weeks after seeding & K upto flowering.	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme.
Terminal drought (Early withdrawal of monsoon)					
	Abundant & erratic rainfall shallow dark grey to brown soils (low land) & Deep dark grey to brown soils(Up & Medium land)	Sali rice (Mono crop-Low & medium land) Sali rice: Ranjit, Bahadur, Pankaj, Kushal, Moniram.Glutinous rice:Gandhi Biroin (local).Scented rice :Badshabhog.	1. Life saving irrigation. 2. Harvest at physiological maturity stage	Winter vegetables, Pulses, early ahu rice	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder

					LLP under RKVY/Govt Scheme
		Sali rice - Oil seeds/pulses (medium land) Cropping System:1 For Sali rice Same as cropping system-1. Rapeseed: TS-36, TS-38, TS-29, M-27. Linseed: T-397 & local. Sesamum: Madhavi, Gouri, Vinayak, Punjab tall No.1, RT-1. Pulses: Rajmah (Local, Uday, PDR-14), Pea (Azad P-1, T-163, Boneville, Local), Black gram (Local, T-9, T-27, KU-309).	1. Life saving irrigation. 2. Divert some area from paddy to pulses & oilseeds. 3. Ridge & furrow cultivation of Rajmah. 4. Harvest at physiological maturity stage (Sali rice)	Oilseed & pulses	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme
		Sali rice-Winter vegetables (medium land) For Sali rice Same as cropping system-1. Winter Vegetables: Cabbage: Drum head, Pride of India, Golden acre. Cauliflower: Snowball-16, Pusa snowball, Pusa Deepali (Early). Tomato: Arka Alok, Suraksha (Hybrid), Pusa ruby, local. Brinjal: JC-1, Pusa purple round, Pusa purple long, Pusa Kranti, Longai (Local). Chilli: Pusa Jwala, Krishna, local. Coriander: UP 41, Pusa 860, local selection. Spinach: All green, Pusa Jyoti, local. Dolichus bean: Pusa early profile, HD-18, local. Potato: Kufri chandramukhi, Kufri Jyoti, Kufri sindhuri. Pumpkin: Local. Amaranthas: Local. Cow pea: Pusa Barsati, local.	1. Life saving irrigation. 2. Divert some area from paddy to winter vegetables. 3. Ridge & furrow cultivation. 4. Harvest at physiological maturity stage (Sali rice)	Winter vegetables	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme
		Sali rice-Boro rice(low land) For Sali rice Same as cropping system-1. Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad,IR-68	1. Same as cropping system-1 for Sali Rice. 2. Timely land preparation & sowing of boro rice.	Boro rice	Same as cropping system-1
		Sali rice-ahu rice(low & medium land) For Sali	1. Same as cropping system-1.	Ahu rice	Same as cropping system-1

		rice Same as cropping system-1. Ahu rice (Transplanted): Luit, Disang, Krishna, Gopinath, Jaya, Cauvery, IR-36, IR-50, Ratna, Culture-1, Soket-4. Ahu rice (Direct seeded): Koimurali. Luit.	2. Divert some area for early ahu rice. 3. Timely land preparation and sowing of <i>ahu</i> rice.		
		Fallow - Boro rice(Typical low land) Boro rice: Kanaklata, Chandrama Local (Rataboro, Kalaboro), Bishnu Prasad,IR-68.	Not applicable	Not applicable	Not applicable
		Summer vegetables - Winter vegetables (River bank, up land & medium land). Summer vegetables: Okra (Prabhani Kranti, Pusa Sawani, Arka anamika, local). Cucumber (Chinese green, Pusa sanyog, Poinsette, AAUC-1, AAUC-2, AAUC-3, AAUC-4, local). Ridge gourd (Pusa Nasdar, AAUJ-2, AAUJ-3, local). Bitter gourd (For spring season-Pusa Do Mausmi, Long green, local, Extra long. For summer-Monsoon monarch, Long green monsoon, Coimbatore long). Bottle gourd: Pusa summer prolific long, Pusa summer prolific round, local. Snake gourd: Long green, Long white, Extra long, local. Winter Vegetables: Same as Cropping System-3.	1. Divert some area for early winter vegetables. 2. Large Scale utilization of organic mulches & FYM. 3. Weeding & breaking of soil mulch by finger weeder. 4. Divert some area for early winter vegetables. 5. Harvest at physiological maturity stage. 6. Life saving irrigation. 7. Timely land preparation and sowing of early winter vegetables.	Early winter vegetables, normal winter vegetables	Supply of seeds through National Calamity relief fund, National disaster management fund Procurement of certified seeds from ASC Ltd. & RARS, AAU. Supply of Water pumps, STW, finger weeder LLP under RKVY/Govt Scheme.
Drought - Irrigated situation					
Delayed release of water in canals due to low rainfall	1) Farming Situation Low land Irrigated red soils	Cropping System:1 Paddy (sub merged condition)			

Limited release of water in canals due to low rainfall	1) Farming Situation	Cropping System:1			
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming Situation	Cropping System:1			
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming Situation	Cropping System:1			
		Cropping System:2			

Resource management technologies-

Resource management technologies (NRM Technologies)

- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Zero tillage for moisture conservation and for increasing cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas
- SRI technology in summer rice for enhancing rice yield with limited water.
- Strip cropping of pineapple with broom grass for minimising erosion and soil loss.

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	NALBARI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1612.4	More than 19%	Less than 1306.044
June	483.8		
July	482.7		
August	306.6		
September	339.3		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	25680	Gross irrigated area:	39029
Net Rainfed area	42181	Gross rainfed area	65083

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1251	3849
Wells	12206	14019
Tanks	305	771
Other sources	11918	20390

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	46304	27712	18592
2	Jowar	-	-	
3	Maize	4067	29	4038
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	75	15	60
2	Groundnut	102		102
3	Sesamum	389	18	371
4	SOyabean	-		
5	Sunflower	11		11
6	Castor	1		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	3530		3530
3	Mesta	11		11
4	Sunhemp	75		75

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	62	16	46
2	Tobacco	-		
3	Guar seed	-		1554
4	Other Fodder crops	1560	6	1554

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation	Crop/ Cropping system	Change in crop cropping system	Agronomic measures	Remarks on implementation
Delay by 4 weeks (Specify month) July 1st week	High rainfall medium land soils	Paddy+Rapeseed Paddy : Mahsuri, Ranjit, Basanti, Local varieties Rapeseed: TS-36. M-27	Paddy: Satyranjan, Basundhar, Rapeseed : TS-36. M-27	1. Decrease spacing in Winter Paddy.	1. Supply of weeder under RKVY 2. Supply of seeds of changed paddy variety through NFSM
		Paddy+Vegetables Paddy: Mahsuri, Ranjit, Basanti and other local Sali variety Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, potato	Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, Potato Pulse: Pea, lentil.		

		Cropping System:3 Paddy+ Pulse Paddy: Mahsuri, Ranjit, Basanti and other local Sali variety Pulse: Lentil, Pea, Blackgram			
	High rainfall low land soils	Paddy+ Paddy Autumn Paddy: Luit, Local varieties Winter Paddy : Ranjit, Mahsuri, Basanti and local varieties			
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	High rainfall medium land soils	Rice+Rapeseed Rice: Mahsuri, Ranjit, Basanti,Local varieties Rapeseed:TS-36. M-27	1. Running weeder rice crop when soil loosens 2. If standing rice crop damages growing varieties such as Basanti, Luit, Kopili Rapeseed: M- 27, TS-38 Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato.	1. Life saving irrigation 2 Application of KCI	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY. Rapeseed: 1. Arrangement of proven seeds of variety TS-36. Potato: 1.Supply of seeds through ASC Vegetable: 1. Supply of seeds through National Horticultural Mission
		Rice+Vegetables Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Paddy+ Pulse Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Pulse: Lentil, Pea, Blackgram			
	High rainfall low land soils	Rice+ Rice AutumnRice: Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties	1. Running weeder rice crop when soil loosens 2. If standing rice crop damages growing varieties such as Luit, Kopili and local varieties.	1. Life saving irrigation 2 Application of KCI	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY
Mid season drought (long dry spell)					
At flowering/ fruiting stage	High rainfall medium land soils	Rice+Rapeseed Rice: Mahsuri, Ranjit, Basanti,Local varieties Rapeseed:TS-36. M-27	1. Running weeder rice crop when soil loosens	1. Life saving irrigation 2 Application of KCI	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2.Supply of seeds through AAU 3.Supply of seeds through NFSM. 4.. Seed drills under RKVY. Rapeseed:
		Rice+Vegetables Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, potato			

		Paddy+ Pulse Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Pulse: Lentil, Pea, Blackgram			1. Arrangement of proven seeds of variety TS-36. Potato : 1. Supply of seeds through ASC Vegetable: 1. Supply of seeds through National Horticultural Mission
	High rainfall low land soils	Rice+ Rice Autumn Rice: Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties	1. Running weeder rice crop when soil loosens	1. Life saving irrigation 2 Application of KCI	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2. Supply of seeds through AAU 3. Supply of seeds through NFSM. 4.. Seed drills under RKVY.
Terminal drought (Early withdrawal of monsoon)					
At flowering/ fruiting stage	High rainfall medium land soils	Rice+ Rapeseed Rice: Mahsuri, Ranjit, Basanti, Local varieties Rapeseed: TS-36. M-27	Running weeder rice crop when soil loosens Rapeseed: M-27, TS-38 Potato: KufriJyoti, Kufri, Chandramukhi KufriMegha Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato.	1. Life saving irrigation 2 Application of KCI	1. Irrigation under the scheme NREGS/ IWMP/ RKVY/NFSM 2. Supply of seeds through AAU 3. Supply of seeds through NFSM. 4.. Seed drills under RKVY. Rapeseed: 1. Arrangement of proven seeds of variety TS-36. Potato : 1. Supply of seeds through ASC Vegetable: 1. Supply of seeds through National Horticultural Mission
		Rice+ Vegetables Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Vegetable: Cabbage, Cauliflower, Knolkhol, Tomato, potato			
		Paddy+ Pulse Rice: Mahsuri, Ranjit, Basanti and other local Sali variety Pulse: Lentil, Pea, Blackgram			
	High rainfall low land soils	Rice+ Rice Autumn Rice : Luit, Local varieties Winter Rice : Ranjit, Mahsuri, Basanti and local varieties			
Drought - Irrigated situation					
Delayed release of water in canals due to low rainfall	Not applicable				
Limited release of water in canals due to low rainfall					
Non release of water in canals under delayed onset of monsoon in catchment					
Insufficient groundwater recharge due to low rainfall	Tube well alluvial soil	Paddy	Aerobic Rice, Maize and vegetables (Tomato, Chilli and Brinjal)	1. Limited irrigation 2. Alternate Furrow irrigation	1. Seeds through ASC, NFSM, NHM etc.

Resource management technologies Very high risk prone districts

- Low cost water harvesting structure, '*Jalkund*' for cropping intensification.
- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Zero tillage for moisture conservation and for increasing cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas
- SRI technology in summer rice for enhancing rice yield with limited water.
- Strip cropping of pineapple with broom grass for minimising erosion and soil loss.

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	SIBSAGAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1202.9	More than 19%	Less than 974.349
June	292.5		
July	378.7		
August	277.6		
September	254.1		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	2260	Gross irrigated area:	2260
Net Rainfed area	81600	Gross rainfed area	90444

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	1770	1770
Tanks	-	-
Other sources	490	490

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	68962	900	68062
2	Jowar	4	-	
3	Maize	188		188
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	17		17
2	Groundnut	10		10
3	Sesamum	67		67
4	SOyabean	7		7

5	Sunflower	-		
6	Castor	6		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	23		23
3	Mesta	6		6
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	35		35
2	Tobacco	-		
3	Guar seed	-		70
4	Other Fodder crops	70		70

Rainfed situation

Condition	Major farming situation	Crop/ Cropping system	Suggested Contingency measures		
			Change in crop cropping system	Agronomic measures	Remarks on implementation
Early season drought (delayed onset) Delay by 4 weeks (July 3 rd week)	1. Rainfed medium land	a. Sali Rice	No any change	No need of change	
	2. Rainfed low land situation	Bao Rice	No any change	1. Use of organic manure if possible 2. 3 % foliar spray of KCl	
		b. Rice + Wheat (DWR/Sonalika)	Grow Medium duration rice varieties like Lachit, Chilarai followed by short duration wheat variety	1. Use closure spacing 10cmx10cm 2. Use of sufficient organic manure	1. The seed should be made available through Seed Village or ASC, Assam, 2. Production of vermicompost or enriched compost may be promoted through community basis
	3. Up land situation	Kharif Maize	Nil	1. Use of organic manure if possible 2. Mulching between the rows	LLP may be provided on community basis
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	1) Farming Situation: Rainfed medium land	a. Sali Rice	• Proper weeding • Thinning the plant population	Application of sufficient amount of organic manures in nursery bed before sowing. • Stop top dressing of urea.	
	Rainfed low land situation	a. Bao Rice	Potash @3 % may be sprayed.		

		b.Rice + Wheat (DWR/Sonalika)	The land should be prepared for early cultivation of wheat		1.The seed should be made available through ASC, Assam,
	Up land situation	Kharif Maize	Nil	1. Use of organic manure if possible 2. Mulching between the rows	LLP may be provided on community basis
At flowering/ fruiting stage					
	Rainfed medium land	a. Sali Rice	• Proper weeding⁹ • Thinning⁹ the plant population and • Spraying⁹ of	• Stop top dressing⁹ of urea. • Crop may be used as fodder	KCI is to be made available to farmers
	Rainfed low land situation	a. Bao Rice	Spraying ⁹ of KCI @ 3%		
		b.Rice + Wheat (DWR/Sonalika)	The land should be prepared for early cultivation		1.The seed should be made available through ASC, Assam,
	Up land situation	Kharif Maize	Nil	1. Use of organic manure if possible 2. Mulching between the rows	LLP may be provided on community basis
Terminal drought (Early withdrawal of monsoon)					
	Rainfed medium land	a. Sali Rice	Spray 2% urea	• The crop may be used as fodder • Land should be prepared for Toria and Potato	The seed should be made available through ASC, Assam
	Rainfed low land situation	a. Bao Rice			
		b.Rice + Wheat (DWR/Sonalika)	The land should be prepared for early cultivation of wheat		1.The seed should be made available through ASC, Assam,
	Up land situation	Kharif Maize	Nil	1. Use of organic manure if possible 2. Mulching between the rows	LLP may be provided on community basis

Drought - Irrigated situation					
Delayed release of water in canals due to low rainfall					
	Irrigated medium land	a. Sali Rice	Potato and toria	- Limited irrigation - Drip irrigation	The seed should be made available through ASC, Assam
		b. Rice + Wheat	The land should be prepared for early cultivation of wheat		1. The seed should be made available through ASC, Assam,
Pre monsoon flood					
	Irrigated medium land	a. Sali Rice	Adoption of short duration rice varieties like Luit, Disang	Limited irrigation Drip irrigation	The seed should be made available through ASC
Hail storm under irrigated condition					
	Irrigated medium land	a. Sali Rice			

Resource management technologies Medium risk prone districts

- Low cost water harvesting structure, 'Jalkund'. This water can be used for supplemental irrigation
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
- The lifesaving irrigation during dry spells at critical stage of crop help to minimize the impact of drought.
- Desilting of drainage channel for quick disposal of flood water in flood prone areas
- Ridges and furrows in maize to conserve moisture for longer days to avoid moisture stress
- Raised bed planting in groundnut to conserve moisture for longer duration.
- Straw mulching in vegetables to conserve moisture and to enhance crop yield
- Green manuring to increase the soil fertility and crop yield
- Polyethylene mulching in vegetables for efficient utilization of inputs
- Zero tillage for moisture conservation and for increasing cropping intensification
- Low cost poly-house for high value vegetables cultivation in Hilly areas
- SRI technology in summer rice for enhancing rice yield with limited water.
- Strip cropping of pineapple with broom grass for minimising erosion and soil loss.

Actionable Comprehensive Plans for Contingency

State	ASSAM	District	SONITPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1144.5	More than 19%	Less than 927.045
June	308		
July	342.4		
August	242.3		
September	251.8		

Forecast probability for the season (as per IMD): Below Normal

Irrigation info:

Net irrigated area:	10601	Gross irrigated area:	12069
Net Rainfed area	70820	Gross rainfed area	147267

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	417	417
Wells	2496	2955
Tanks	59	72
Other sources	7629	8625

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	69641	11801	57840
2	Jowar	-	-	
3	Maize	4336		4336
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	454		454
2	Groundnut	54		54
3	Sesamum	711		711
4	SOyabean	197		197
5	Sunflower	13		13
6	Castor	4		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	4		4
2	Jute	1894		1894
3	Mesta	83		83
4	Sunhemp	5		5

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	1033		1033
2	Tobacco	-		
3	Guar seed	-		700
4	Other Fodder crops	700		700

Crop Plan- Beginning of the season

Rainfed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major farming situation	Crop/ Cropping system	Change in crop cropping system	Agronomic measures	Remarks on implementation

Delay by 4 weeks (Specify month) July 1st week	Rainfed landup	Summer vegetables/ Blackgram/Sesame (<i>kharif</i>) - Toria/ Wheat/Potato/ <i>Rabi</i> vegetables/chilli	Summer vegetables/ Blackgram/Sesame (<i>kharif</i>) - Toria/Chilli/ Wheat/Potato/ <i>Rabi</i> vegetables	) Life saving supplemental irrigation ii) Weeding at critical stages of growth. iii) Supplemental irrigation in the nursery bed of <i>Rabi</i> vegetables iv) Addition of sufficient organic matter in the soil at the time of land preparation.	
		Rice- Potato/pea a) Winter rice + Potato b) Winter rice + Pea	Winter rice - Medium duration variety such as <i>Satyaranjan</i>, <i>Basundhar</i>, <i>Mulagabharu</i>, <i>TT B404</i> Winter rice- Ranjit, Bahadur, Kushal, Moniram Potato- Kufri Chandramukhi, K. Jyoti, K. Sindhuri, K. Megha Pea – Boneville, Rachna, HUP <i>a</i>	i. Weed management, ii. Supply of minimum irrigation iii. Seed hardening-(18 hrs. soaking in water followed by 24 hrs. shade drying	
	Rainfed medium land	Sugarcane as mono crop Wiinter paddy – fallow Winter paddy – summer / autumn paddy Winter paddy – rabi crops	i) Late sown/ transplanted winter paddy variety like <i>Gitesh</i>, <i>Prafulla</i> etc. --- summer / autumn paddy ii)) Late sown/ transplanted & early maturing winter paddy variety like <i>Lachit</i>, <i>Luit</i> etc. . --- summer / autumn paddy / rabi crops iii) Traditional paddy varieties like <i>Monohar Sali</i>, <i>Sial Sali</i> etc. for late sown condition --rabi crops	i) Delayed sowing with high seed rate / transplanting ii) Timely sowing but delayed transplanting of winter paddy iii) Closure spacing during transplanting iv) Increase no. of seedlings / hill v) Mulching in sugarcane & <i>kharif</i> vegetables vi) Use of organic manure vii) Minimise no. of top dressing of fertilizer (not during dry spell)	i) Seed production of suitable varieties so that these can be made available in time ii) Community nursery for traditional as well as HY short duration/ late planted varieties of paddy iii) Identification & evaluation of suitable varieties specific to prevailing situation iv) Demonstration programme in real field situation for farmers' motivation

	Rainfed low land	Winter paddy—fallow	i) Late sown/ transplanted winter paddy variety like <i>Gitesh, Prafulla</i> etc. --- summer / autumn paddy ii) Late sown/ transplanted & early maturing winter paddy variety like <i>Lachit, Luit</i> etc. . --- summer / autumn paddy / rabi crops iii) Traditional paddy varieties like <i>Monohar Sali, Sial Sali</i> etc. for late sown condition --rabi crops	i) Delayed sowing with high seed rate / transplanting ii) Timely sowing but delayed transplanting of winter paddy iii) Closure spacing during transplanting iv) Increase no. of seedlings / hill v) Use of organic manure vii) Minimise no. of top dressing of fertilizer (not during dry spell)	i) Seed production of suitable varieties so that these can be made available in time ii) Community nursery for traditional as well as HY short duration/ late planted varieties of paddy iii) Identification & evaluation of suitable varieties specific to prevailing situation iv) Demonstration programme in real field situation for farmers' motivation
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Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)

At vegetative stage	Rainfed high / medium land	Sugarcane as mono crop	i) Delayed transplanting ii) Increasing no. of seedling / hill iii) Closure spacing of transplanting iv) See for alternative source of water v) Top dressing of fertilizer is delayed & minimized only when there is water/ available moisture	i) Maximum use of organic manure ii) Use of organic mulch in <i>kharif</i> vegetables/sugarcane	i) Identification & evaluation of suitable varieties specific to prevailing situation ii) Demonstration programme in real field situation for farmers' motivation iii) Identification of ITK if any
		Winter paddy – fallow			
		<i>Kharif</i> vegetables – <i>rabi</i> vegetables/ <i>rabi</i> crops			
		Winter paddy – summer/ autumn paddy			
		Winter paddy – <i>rabi</i> crops			
	Rainfed medium / low land	Winter paddy—summer / autumn paddy	i) Delayed transplanting ii) Increasing no. of seedling / hill iii) Closure spacing of transplanting	i) Maximum use of organic manure ii) Use of organic mulch in vegetables iii) Minimising no. of top dressing (not during dry spell)	i) Identification & evaluation of suitable varieties specific to prevailing situation ii) Demonstration programme in real field
		Winter paddy— <i>rabi</i> crops/			
		<i>Kharif</i> vegetables – <i>rabi</i> vegetables			
		Winter paddy—summer / autumn paddy			

					situation for farmers' motivation iii) Identification of ITK if any
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Rainfed high / medium land	Sugarcane as mono crop	i) Weeding at critical stages.	i) Maximum use of organic manure	i) Method demonstration
		Winter paddy – fallow	ii) See for alternative sources of water	ii) Use of organic mulch in kharif vegetables / sugarcane iii) Minimising no. of top dressing (not during dry spell)	ii) Identification & evaluation of suitable varieties specific to prevailing situation iii) Identification of ITK if any
		Kharif vegetables – rabi vegetables/ rabi crops			
		Winter paddy – summer / autumn paddy			
		Winter paddy – rabi crops			
	Rainfed medium / low land	Winter paddy—fallow	i) Weeding at critical stages ii) See for alternative sources of water such as low cost irrigation system (Treadle pump)	i) Maximum use of organic manure ii) Use of organic mulch in vegetables iii) Minimising no. of top dressing (not during dry spell)	i) Method demonstration ii) Identification & evaluation of suitable varieties specific to prevailing situation iii) Identification of ITK if any
		Winter paddy—summer/ autumn paddy			
		iii) Winter paddy—rabi crops/vegetables			
		iv) Kharif vegetables – rabi vegetables			
Terminal drought (Early withdrawal of monsoon)					
Terminal drought	Rainfed high / medium land	Sugarcane as mono crop	i) See for alternative sources of water ii) Application of water through low cost irrigation system such as treadle pump.	i) Zero-tillage / optimum tillage cultivation of rabi crops ii) Practice of relay cropping ii) Use of organic mulch in rabi vegetables / crops iii) Application of organic manures as much as possible	i) Method demonstration ii) Identification & evaluation of suitable varieties specific to prevailing situation iii) Identification of ITK if any
		Winter paddy – fallow			
		Kharif vegetables – rabi vegetables/ rabi crops			
		iii) Winter paddy – summer / autumn paddy			
		Winter paddy – rabi crops			
	Rainfed medium / low land	Winter paddy—fallow	i) See for alternative sources of water ii) Avoid burning of leftovers of	i) Zero-tillage / optimum tillage cultivation of rabi crops (Relay cropping of lentil, Lathyrus with rice) ii) Avoid burning of leftovers of paddy after	i) Identification & evaluation of suitable varieties specific to prevailing situation
		Winter paddy—summer / autumn paddy			
		Winter paddy—rabi crops/ vegetables			

		<i>Kharif</i> vegetables – <i>rabi</i> vegetables	paddy after harvest	harvest & incorporation in the field during ploughing ii) Use of organic mulch in <i>rabi</i> vegetables / crops iii) Application of organic manures as much as possible	ii) Demonstration programme in real field situation for farmers' motivation v) Identification of ITK if any
Drought - Irrigated situation					
Delayed release of water in canals due to low rainfall	1) Farming Situation	Not applicable			
	2) Farming Situation	Not applicable			
Limited release of water in canals due to low rainfall	1) Farming Situation	Not applicable			
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming Situation	Not applicable			
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland / medium land	Winter paddy – fallow <i>Kharif</i> vegetables – <i>rabi</i> vegetables/ <i>rabi</i> crops Winter paddy – summer / autumn paddy Winter paddy – <i>rabi</i> crops	i) Late sown / transplanted winter paddy – fallow ii) Late sown / transplanted winter paddy – summer / autumn paddy iii) Fallow – <i>kharif</i> oilseeds / pulses—late sown <i>rabi</i> crops iv) Fallow – timely sown <i>rabi</i> crops / vegetables	i) Application of organic manures as much as possible ii) Removal of weeds iii) Use of organic mulches iv) Incorporation of crop residues v) Multiple cropping vi) Practice of zero/minimum tillage cultivation vii) Avoidance of use of agro-chemicals during dry spells viii) Measures to minimize percolation loss of water from tank ix) Economic use of water at critical stage of crop	
	Medium / low land	Winter paddy—fallow Winter paddy—summer / autumn paddy	i) Late sown / transplanted winter paddy – fallow	i) Application of organic manures as much as possible ii) Removal of weeds	

		Winter paddy—<i>rabi</i> crops/vegetables <i>Kharif</i> vegetables – <i>rabi</i> vegetables	ii) Late sown / transplanted winter paddy – summer / autumn paddy iii) Fallow – <i>kharif</i> oilseeds / pulses—late sown <i>rabi</i> crops iv) Fallow – timely sown <i>rabi</i> crops / vegetables	iii) Use of organic mulches iv) Incorporation of crop residues v) Multiple cropping vi) Practice of zero ? minimum tillage cultivation vii) Avoidance of use of agro-chemicals during dry spells viii) Measures to minimize percolation loss of water from tank ix) Economic use of water at critical stage of crop	
Insufficient groundwater recharge due to low rainfall	Upland / medium land	Winter paddy – fallow <i>Kharif</i> vegetables – <i>rabi</i> vegetables/ <i>rabi</i> crops Winter paddy – summer / autumn paddy Winter paddy – <i>rabi</i> crops	i) Late sown / transplanted winter paddy – fallow ii) Late sown / transplanted winter paddy – summer / autumn paddy iii) Fallow – <i>kharif</i> oilseeds / pulses—late sown <i>rabi</i> crops iv) Fallow – timely sown <i>rabi</i> crops / vegetables	i) Application of organic manures as much as possible ii) Removal of weeds iii) Use of organic mulches iv) Incorporation of crop residues v) Multiple cropping vi) Practice of zero / minimum tillage cultivation vii) Avoidance of use of agro-chemicals during dry spells viii) Measures to minimize percolation loss of water from well & distribution loss through delivery pipes ix) Economic use of water at critical stage of crop	
	Medium / low land	Winter paddy—fallow Winter paddy—summer / autumn paddy Winter paddy—<i>rabi</i> crops/vegetables <i>Kharif</i> vegetables – <i>rabi</i> vegetables	i) Late sown / transplanted winter paddy – fallow ii) Late sown / transplanted winter paddy – summer / autumn paddy	i) Application of organic manures as much as possible ii) Removal of weeds iii) Use of organic mulches iv) Incorporation of crop residues v) Multiple cropping	

			iii) Fallow – kharif oilseeds / pulses—late sown rabi crops iv) Fallow – timely sown rabi crops / vegetables	vi) Practice of zero/ minimum tillage cultivation vii) Avoidance of use of agro-chemicals during dry spells viii) Measures to minimize percolation loss of water from well & distribution loss through delivery pipes ix) Economic use of water at critical stage of crop	
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Resource management technologies

- Low cost water harvesting structure, '*Jalkund*'. This water can be used for supplemental irrigation
- Desilting of community pond and application of fertile tank silt to the fields improves soil health and WHC, this reduces the fertilizer requirements.
- Artificial ground water recharge pits for ground water augmentation and for cropping intensification
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