



भारतीय कृषि
ICAR

INDIAN COUNCIL OF
AGRICULTURAL RESEARCH

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

PREPAREDNESS | RESPONSE | RESILIENCE



BUILDING A
DROUGHT RESILIENT
BIHAR



PADDY



MAIZE



PIGEON PEA
(TUR)



EARLY WARNING
& MONITORING



WATER
MANAGEMENT



SUSTAINABLE
AGRICULTURE



COMMUNITY
PARTICIPATION

TOGETHER, LET'S BUILD A RESILIENT BIHAR

PREPARE TODAY • PROTECT TOMORROW • PROSPER TOGETHER

Bihar

Bihar is one of the major agricultural states of eastern India, where agriculture forms the backbone of the state's economy. More than 70 percent of the population depends directly or indirectly on agriculture and allied activities for their livelihood. The state is endowed with fertile alluvial soils deposited by the Ganga and its tributaries, making it highly suitable for crop production. Agriculture contributes significantly to the state's economy and supports allied sectors such as livestock, fisheries, horticulture, and agro-based industries.

Bihar is an important producer of rice, maize, wheat, pulses, sugarcane, and several horticultural crops. During the Kharif season, rice, maize, pigeon pea, black gram, green gram, jute, and sugarcane are the major crops. During the Rabi season, wheat, lentil, chickpea, mustard, maize, and vegetables are widely cultivated. Bihar is among the leading producers of maize in India and is also known for its significant production of fruits such as litchi, banana, and mango.

The state receives an average annual rainfall of approximately 1000–1400 mm, with nearly 80–85 percent of the rainfall occurring during the southwest monsoon season (June to September). Consequently, agricultural production in Bihar is highly dependent on the timely onset, distribution, and quantity of monsoon rainfall.

Historical Impact of El Nino on Bihar

Bihar is highly vulnerable to El Nino-induced monsoon variability because a considerable portion of Kharif agriculture depends on rainfall despite increasing irrigation coverage. During El Nino years, the state frequently experiences delayed monsoon onset, below-normal rainfall, prolonged dry spells, and higher temperatures. These conditions adversely affect sowing operations, crop establishment, and crop growth, especially for rice and maize.

Reduced rainfall causes moisture stress during critical crop growth stages, leading to lower productivity, increased irrigation requirements, and reduced farm incomes. In severe El Nino years, groundwater extraction increases substantially, raising production costs for farmers.

Effects on Major Crops

- **Rice (Paddy):** Delayed nursery raising and transplanting, poor tillering, reduced grain filling, and lower yields.

- **Maize:** Poor germination, moisture stress during tasseling and grain filling, reduced cob development, and lower productivity.
- **Sugarcane:** Reduced cane growth, lower sucrose accumulation, and decreased cane yield.
- **Pulses (Pigeon pea, Black gram, Green gram):** Poor germination, flower drop, reduced pod formation, and lower seed yield.
- **Jute:** Poor vegetative growth due to inadequate soil moisture, leading to reduced fibre yield.
- **Oilseeds (Sesame):** Poor establishment and reduced capsule formation under moisture deficit.
- **Vegetables:** Increased irrigation demand, reduced fruit setting, and lower marketable yield.

Contingency Plans for Major Crops Grown in Bihar

Crop	El Nino Situation	Recommended Contingency Measures
Rice (Paddy)	Delayed monsoon or delayed transplanting	Community nursery, direct-seeded rice (DSR), short-duration varieties
	Severe rainfall deficit	Shift to maize, pigeon pea, black gram or sesame in uplands
Maize	Delayed sowing	Use early maturing and drought-tolerant hybrids
	Mid-season drought	Mulching, protective irrigation, foliar spray of 2% KCl
Pigeon pea (Tur)	Delayed sowing	Short-duration varieties and intercropping
	Moisture stress	Mulching and protective irrigation
Black gram (Urdbean)	Late sowing	Shift to short-duration cultivars
	Dry spell	Foliar nutrition and moisture conservation
Green gram (Moongbean)	Late Kharif sowing	Early maturing varieties
	Drought	Foliar spray of 2% urea
Sesame (Til)	Failure of paddy sowing	Use as contingency crop in upland conditions
Sugarcane	Moisture stress	Trash mulching, drip irrigation, life-saving irrigation

Agriculture is the primary source of livelihood for a large proportion of Bihar's population and plays a crucial role in the state's economy. However, the sector remains

highly sensitive to monsoon variability associated with El Nino. Delayed rainfall, prolonged dry spells, and elevated temperatures during El Nino years significantly reduce the productivity of major kharif crops such as Rice, Maize, Pulses, Sugarcane, and Jute. Strengthening climate-resilient agriculture through timely contingency planning, promotion of drought-tolerant crop varieties, efficient water management, crop diversification, and improved weather-based agro-advisories will help minimize production losses and enhance the resilience of Bihar's farming systems.

Area under major crops

Crop	Area (lakh ha)
Paddy	32.42
Maize	8.96
Pigeon pea	0.12

Districts vulnerable to El Nino

High	Medium	Low
Nil	Jamui, Bhagalpur, Katihar, Patna	Kishanganj, Nawada, Sheikhpura, Samastipur, Sheohar, Nalanda, Sitamarhi, Begusarai

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	BEGUSARAI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1009.5	More than 19%	Less than 817.695
June	165.6		
July	318.3		
August	256		
September	269.6		

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

Irrigation info:

Net irrigated area:	119173	Gross irrigated area:	140869
Net Rainfed area	4277	Gross rainfed area	74179

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	118386	139459
Tanks	533	1064
Other sources	254	346

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	12072	8156	3916
2	Jowar	166	-	
3	Maize	71585	34159	37426
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	286		286
2	Groundnut	-		
3	Sesamum	13		13
4	Soyabean	17219		17219
5	Sunflower	-		
6	Castor	-		

Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	4408	4320	88
2	Tobacco	17	17	0
3	Guar seed	-		7820
4	Fodder crops	8167	347	7820

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 2 nd week of July	Very deep, Calcareous fine loamy soils Upland	Rice –Wheat Rice-Rabi maize Maize-Rabi maize Maize- Wheat	Soyabean – Wheat/Maize Vegetables-Wheat Maize-Rabi maize Pigeonpea+ Blackgram Sponge gourd- Wheat Blackgram- Wheat Rice - Prefer Medium to short duration varieties like Saroj (100-110d), Birsa Dhan-201 (100-115d) Pigeonpea – Bahar, Pusa-9 Narendra Pigeonpea-I	• Direct seeding of rice with medium duration drought tolerant varieties with pre emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for effective weed management.	Seeds from BRBN, RAU, Pusa, NSC, TDC

			Maize- Shaktiman-1,2,3,4, Suwan, Ganga-11, DeokiPusa early hybridMakka-3 Blackgram- T-9, Navin, Pant U 31 ,19	• Interculture for timely weed control in direct seeded rice • Application of organic manure and vermicompost initially	
	Mid land	Rice-Wheat	Mid duration Rice-Wheat Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati,	• Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Low land	Rice-Wheat	Rice - Wheat Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Sakuntala, Satyam, Kishori , Swarna sub-1, Masore, Rajshree	• Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands • Raise staggered community nursery preferably with short duration varieties in mid and lowlands • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. • Para grass cultivation for fodder in low land • Timely interculture for weed control in direct seeded rice	
Mid season drought (long dry spell, consecutive 2 weeks	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation

rainless (>2.5 mm) period)					
At vegetative stage	Very deep, Calcareous fine loamy soils Upland	Rice –Wheat	- Gap filling - Life saving Irrigation	- Inter culturing - Mulching through weeds, - Conservation tillage - Life saving irrigation - Foliar spray (1%) MOP on the crops	
		Rice- Prabhat, Dhanlaxmi,			
		Richharia, Turanta, Wheat- HD- 2733, PBW- 343, HP-1731			
	Maize- Wheat				
	Maize- Shaktiman- 1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Macca-3				
Mid land	Vegetables				
Lowland	Rice-Wheat- Green gram				
	Rice- Rajshree, Santosh, Sita, Rajendra Suwasni				
	Rajendra Sweta				
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Up land	Vegetables- Wheat Rice-Wheat	-	- Interculturing - Mulching through weed - Life saving irrigation - Foliar spray (1%) MOP	
		Maize – Wheat	- Life saving irrigation - Clipping of leaves in maize		

	Medium land	Rice-Wheat	• IPM practices • Life saving irrigation		
	Lowland	Rice-Wheat			
Terminal drought (Early withdrawal of monsoon)	Very deep, Calcareous fine loamy, coarse loamy soils	Vegetables	• Foliar spray (1%) MOP • Mulching • Harvest at physiological maturity	Open the furrow during evening and leave furrow open overnight and planking in the next morning before sunrise for growing of early rabi crops	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium	Rice-Wheat Rice- Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santosh			
	Low	Rice- Wheat Rice- Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri			

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					

			Blackgram-Wheat Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Blackgram- T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19	Mulching for moisture conservation	
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Resource management technologies

1. Rain water harvesting and recycling for supplemental irrigation.
2. Rooftop Rainwater Harvesting: an innovative and sustainable approach towards water conservation
3. Mulching as *in situ* moisture conservation.
4. ZT wheat with seed cum fertilizer drill/Happy seeder
5. Raised bed method of sowing of potato variety Kufri Pukhraj.
6. Direct seeding of rice to conserve resources and minimise the impact of weather aberrations
7. Zero Tillage: A Profitable Resource Saving for Solid Seeding Crops with Soil Management benefits
8. Bamboo boring with refinement to irrigate cucurbits in stress situation

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	BHAGALPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	970.2	More than 19%	Less than 785.862
June	179.5		
July	301.9		
August	240.1		
September	248.7		

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

Irrigation info:

Net irrigated area:	49310	Gross irrigated area:	99538
Net Rainfed area	64542	Gross rainfed area	57470

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	4157	8394
Wells	44656	90138
Tanks	-	-
Other sources	497	1006

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	22479	16295	6184
2	Jowar	13	-	
3	Maize	64495	42655	21840
4	Bajra	14		14
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	175		175
2	Groundnut	-		
3	Sesamum	11		11
4	Soyabean	-		
5	Sunflower	61	55	6
6	Castor	6		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	36		36
4	Sunhemp	60		60

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	481	298	183
2	Tobacco	8	3	5
3	Guar seed	-		93
4	Fodder crops	93		93

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures		
Early season drought	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
Delay by 4 weeks 3 rd week of July	1.Upland	Rice- Wheat	Rice – Wheat Pigeonpea – Blackgram Rice- Prefer Medium to short duration varieties like Saroj (100-110d), Birsa Dhan-201 (100-115d) Pigeonpea– Malviya – 13,NDA – 1, Bahar, Pusa – 9	- Direct seeding of rice with medium duration drought tolerant varieties with pre emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for effective weed management. - Normal sowing of rice can be used with enhanced NPK to boost the early vegetative growth in late plantings under sufficient moisture - Interculture for timely weed control in direct seeded riceLife saving irrigation - Drum seeding may also be used	Seeds from RAU, Pusa, NSC, TDC , BRBN, BAC, Sabour etc.
	2. Medium land	Rice – Wheat	Rice-Wheat Direct sowing / 20d old dapog seedlings with medium to short duration	Where field is moist, direct seeding of medium duration varieties (125	

			varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita	days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	3. Low land	Rice – Wheat	Rice – Wheat Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1 (130-140 days long duration variety should be selected)	• Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands • Raise staggered community nursery preferably with short duration varieties in mid and lowlands • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. • Enhanced dose of nitrogen with full basal dose of NPK at the time of transplanting to boost the early vegetative growth in late plantings under sufficient moisture • Timely interculture for weed control	

				in direct seeded rice Life saving irrigation	
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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.Upland Very deep, calcareous fine loamy soils	Rice-Potato Rice –Wheat Pigeonpea- Blackgram Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I	- Gap filling of existing crop, - Postpone ment of top dressing	- Inter cultivation - Mulching - Conservation tillage - Life saving irrigation - Spray of potassic fertilizer with adjuvant - Foliar spray (1%) Urea on the crops	
	2) Medium land	Rice-Wheat-Greengram Rice- - Rajendra Bhagawati, Rajendra Suwasni Rajshree, Prabhat	- Gap filling of existing crop - Postponement of top dressing	-	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation

At flowering/ fruiting stage	Upland	Rice-Wheat	Foliar application of 1% urea to boost up the vegetative growth	- Intercultivation - Mulching - Conservation tillage - Life saving irrigation	
	Very deep, calcareous fine loamy soils	Vegetables – Wheat			
		Rice-Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj			
	2. Medium land	Maize-Wheat	- IPM practices - Clipping of maize leaves - Spray of pesticides with spreader		
		Maize - Shaktiman-1,2,3,4 Suwan,			
		Ganga-11, Deoki,Pusa early hybrid Maka-3			
		Pigeonpea-Blackgram	IPM practices		
		Pigeonpea : Var. Bahar, Narendra Arhar-1			
	3. Lowland	Rice-Wheat-Green gram	-		
		Rice- Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta			

Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	1. Upland	Rice-Wheat	- Foliar spray of potassic fertilizer with adjuvant - Life saving irrigation - Mulching - Thinning - Clipping of leaves in maize	Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables	
	Very deep, calcareous fine loamy soils	Rice-Prabhat, Dhanlaxmi, Richharia, Turanta , Saroj			
	2. Medium land	Maize-wheat			
		Maize - Shaktiman-1,2,3,4,			

		Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3			
		Pigeonpea Var. Bahar, Narendra Arhar-1			
	3 Lowland	Rice-Wheat-Green gram Rice- Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta			

Resource management technologies

1. Bamboo boring with refinement to irrigate cucurbits in stress situation
2. Rain water harvesting through farm pond and roof top water harvesting
3. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
4. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
5. Desilting and renovation of defuncted check dam
6. Ridge and furrow method in different crops
7. Line sowing of mustard through seed drill
8. Mulching with organic residues in vegetables like pointed gourd
9. Water harvesting through construction of farm ponds
10. Green manuring in dhaincha in paddy
11. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	JAMUI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	936.4	More than 19%	Less than 758.484
June	147.4		
July	311.2		
August	232		
September	245.8		

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

Irrigation info:

Net irrigated area:	17942	Gross irrigated area:	36114
Net Rainfed area	27465	Gross rainfed area	37888

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1664	2565
Wells	15194	30757
Tanks	1084	2792
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	38842	15112	23730
2	Jowar	-	-	
3	Maize	2367	410	1957
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	1276		1276
2	Groundnut	-		
3	Sesamum	-		
4	Soyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

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

Other crops

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

Crop Plan- Beginning of the season

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 2 nd week of July	Up land Medium to low deep soil Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	Maize-Pigeonpea Maize Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Extra Early Pigeon pea ICPL- 88039 Bahar	• Normal package of Practices • Life saving irrigation • Use of mulches • Gap filling • Balanced dose of NPK	Seeds from BRBN, BAU, Sabour, NSC, TDC

Contingency measures- Mid season

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 measues	Remarks on Implementation
	Medium land	Rice- Wheat Rice- Maize Rice – Pusa 2-21, Rajendra Suwasni Prabhat , Sita safed Wheat - HD-2733, PBW-343, HP-1731 Maize Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3	- Gap filling of existing crop - Postponement of top dressing - Protective spray of pesticides with adjuvant against BLB, BLAST & BPH - Life saving irrigation	- Mulching through weeds, - Direct seeding of rice - Spray of potassic fertilizer with adjuvant - Spray (1%) Urea on the crops and zinc sulphate	

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 measues	Remarks on Implementation
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice - Sita safed Rajendra Suwasni, Rajendra Sweta Rajendra Mansoori-1 Wheat - HD-2733, PBW-343, HP-1731 Maize Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki,	- Gap filling of existing crop - Postponement of top dressing - Protective spray of pesticides with adjuvant against BLB, BLAST & BPH - Life saving irrigation	- Mulching through weeds, - Direct seeding of rice - Spray of potassic fertilizer with adjuvant - Spray (1%) Urea on the crops and zinc sulphate	

		Pusa early hybrid Maka-3 Greengram Pusa Bashakhi, SML 668, PDM-54			
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Condition			Suggested Contingency measures		
Mid-season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Up land Medium to low deep soil Sandy loam to clay loam soil.	1.Maize- Fallow 2Pigeonpea- Fallow Maize Shaktiman-1,2,3,4 ,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Pigeonpea: NDA-1, NDA-2, Bahar, Malviya-9	• IPM practices • Lifesaving irrigation • Spray of pesticides with spreader	• Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium land	1.Rice- Wheat 2.Rice- Maize Medium duration Rice Rice – Pusa 2-21, Rajendra Suwasni Prabhat , Sita safed Wheat - HD-2733, PBW-343, HP-1731 Maize - Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3	• IPM practices • Lifesaving irrigation • Spray of pesticides with spreader	• Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management ^c	Soil nutrient & moisture conservation measures	Remarks on Implementation

	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice- Sita safed Rajendra Suwasini, Rajendra Sweta Rajendra Mansoori-1 Wheat- HD-2733, PBW-343, PBW-502, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Greengram Pusa Bashakhi, SML 668, PDM-54	• IPM practices • Life saving irrigation • Spray of pesticides with spreader	• Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient	
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Contingency measures- End of the season

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Medium land	1.Rice- Wheat 2.Rice- Maize Medium duration Rice Rice – Pusa 2-21, Rajendra Suwasini Prabhat , Sita safed Wheat- HD-2733, PBW-343, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki,	• Spray of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching • Thinning • Clipping of leaves in maize	• Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Gram/ Lentil /Mustard/ Linseed • Stored water to be used at critical stage of growth	

		Pusa early hybrid Makka-3		To clean irrigation channel for preventing loss of moisture through seepage	
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Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice- Sita safed Rajendra Suwasini, Rajendra Sweta Rajendra Mansoori- 1 Wheat- HD-2733, PBW-343, PBW-502, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Greengram Pusa Bashakhi, SML 668, PDM-54	- Spray of potassic fertilizer with adjuvant - IPM practices - Life saving irrigation - Mulching - Thinning - Clipping of leaves in maize	- Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Gram/ Lentil /Mustard/ Linseed - Stored water to be used at critical stage of growth - To clean irrigation channel for preventing loss of moisture through seepage	

Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Upland	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize	1.Mustard- Greengram 2.Maize- Potato 3.Maize- Lentil Mustard - 66-197-3, Rajendra Sarson-I Lentil- PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3 Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	- Spray of Potassic fertilizer - Life saving irrigation - Use of mulches - Spray of micronutrient	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	Upland	1.Rice- Wheat- Green gram 2.Rice- Potato- Summer vegetable 3.Rice- Maize- Green gram	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize Rice - Prabhat, Dhanlaxmi, Richarria, Saroj Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok, Pusa early hybrid Macca-3	- Spray of Potassic fertilizer - Life saving irrigation - Use of mulches - Spray of micronutrient	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti		
	Low land	1.Rice- Wheat- Green gram 2.Rice- Potato 3.Rice- Onion	1.Rice- Wheat- 2.Rice- Lentil/ Linseed 3.Rice- Chickpea Rice - Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya Linseed - Shubra, Garima, Sweta Lentil - PL-406, Malika, Arun Chickpea - Pusa-236, KPG-39 (Uday) , Pusa-372, SG-2	• Spray of Potassic fertilizer • Life saving irrigation • Use of mulches • Spray of micronutrient	
Non release of water in canals under delayed onset of monsoon in catchment	Upland	1.Rice- Wheat- Green gram 2.Rice- Potato- Summer vegetable 3.Rice- Maize- Green gram	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize Rice - Prabhat, Richarria, Saroj Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3 Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	• Spray of Potassic fertilizer • Life saving irrigation • Direct seeding of rice • Use of mulches • Spray of micronutrient	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
	Low land	1.Rice- Wheat- Green gram 2.Rice- Potato 3.Rice- Onion	1.Rice- Wheat- 2.Rice- Lentil/ Linseed 3.Rice- Chickpea Rice: Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya Linseed- Shubra, Garima, Sweta Lentil- PL-406, Malika, Arun Chickpea - Pusa-236, KPG-39 (Uday) , Pusa-372, SG-2	• Spray of Potassic fertilizer • Life saving irrigation • Direct seeding of rice • Use of mulches • Spray of micronutrient	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Not Applicable				
Insufficient groundwater recharge due to low rainfall					

Resource management technologies

12. Bamboo boring with refinement to irrigate cucurbits in stress situation
13. Rain water harvesting through farm pond and roof top water harvesting
14. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
15. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
16. Desilting and renovation of defuncted check dam
17. Ridge and furrow method in different crops
18. Line sowing of mustard through seed drill
19. Mulching with organic residues in vegetables like pointed gourd
20. Water harvesting through construction of farm ponds
21. Green manuring in dhaincha in paddy
22. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	KATIHAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1078.9	More than 19%	Less than 873.909
June	211.9		
July	337.8		
August	237.5		
September	291.7		

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

Irrigation info:

Net irrigated area:	64887	Gross irrigated area:	177919
Net Rainfed area	67749	Gross rainfed area	45874

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1974	5658
Wells	62285	170624
Tanks	-	-
Other sources	628	1637

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	57772	39481	18291
2	Jowar	-	-	
3	Maize	81323	79998	1325
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

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

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	16475		16475
3	Mesta	594		594
4	Sunhemp	-		

Other crops

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

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop / Cropping system ^b	Change in crop / cropping system ^c including variety	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 4 weeks (Specify month) 2nd week of July	Upland	Rice- Wheat	Short duration Rice- Wheat Rice:Prabhat, Dhanlaxmi, Richharia, Turanta Wheat: HD-2733, PBW- 443, PBW- 502	- Old age 30-35 day seedlings of early rice variety may also be using 3-4 seedlings/hill. 20 days Dapog seedling can be used in rice	Seeds from BRBN, BAU, Sabour, NSC, TDC

				Direct seeding of rice	
	Medium land	Rice – Wheat	Rice-Wheat Rice: Rajendra Bhagawati, Rajendra Suwasni Wheat: HD-2733, PBW-443, PBW-502 Rajshree, Prabhat	- Old age 30-35 day seedlings of early rice variety may also be using 3-4 seedlings/hill. 20 days Dapog seedling can be used in rice	
	Lowland	Rice – Wheat Jute- Boro rice	Rice – Wheat Rice: Rajshree, Santosh , Sita Rajendra Suwasni.	Old age rice seedling of 30-35 days may be used with three seedling per hill with close spacing	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure ^s	Remarks on Implementation
At vegetative stage	Upland	Rice-Potato/ Rice –Wheat Rice: Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj Potato: PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	- Gap filling of existing crop - Postponement of top dressing - Protective spray of pesticides with adjuvant against BLB, BLAST & Helminthosporium leaf spot	- Inter culturing - Mulching through weeds - Conservation tillage - Life saving irrigation - Spray of potassic fertilizer with adjuvant	Seeds from BRBN, BAU, Sabour, NSC, TDC

		Wheat: HD-2733, PBW-343, HP-1731, HD-2824		Spray (1%) Urea on the crops	
	Medium land	Rice-Wheat-Greengram Rice: Rajendra Bhagawati, Rajendra Suwasni, Rajshree, Prabhat Wheat: HD-2733, PBW-343, HP-1731, HD-2824 Greengram: SML-6-68, Pusa Vishal, Samarat	- Gap filling of existing crop - Postponement of top dressing - Protective spray of pesticides with adjuvant against BLB, BLAST & Helminthosporium leaf spot	- Inter culturing - Mulching through weeds - Conservation tillage - Lifesaving irrigation - Spray of potassic fertilizer with adjuvant - Spray (1%) Urea on the crops	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management	Soil nutrient & moisture conservation measures ^c	Remarks on Implementation
At flowering/ fruiting stage	Upland	Rice-Wheat/ Vegetable – Wheat Rice: Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj Wheat: HD-2733, PBW-343, HP-1731, HD-2824	- IPM practices - Spray of pesticides with spreader	- Interculturing - Mulching through weeds - Conservation tillage - Life saving irrigation	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium land	Maize-Wheat Maize: Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Wheat: HD-2733, PBW-343, HP-1731, HD-282	- IPM practices - Clipping of maize leaves	- Interculturing - Mulching through weeds - Conservation tillage - Life saving irrigation - Spray of potash and nitrogen fertilizer with adjuvant	
	Lowland	Rice-Wheat-Greengram	IPM practice	- Inter culturing - Mulching through weeds - Life saving irrigation	

		Rice: Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343 HP-1731, HD-2824		Conservation tillage	
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Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management	Rabi Crop planning	Remarks on Implementation
	Upland	Rice-Wheat/ Vegetable – Wheat Rice:Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj Wheat: HD-2733, PBW-343, HP- 1731, HD-2824	- Spray of potassic fertilizer with adjuvant - IPM practices - Life saving irrigation - Mulching	- Stored water to be used at critical stage of growth - To clean irrigation channel for preventing loss of moisture through seepage	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium land	Maize-Wheat Maize: Shaktiman-1,2,3,4 ,5Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Wheat: HD-2733, PBW-343, HP- 1731, HD-282	- Spray of potassic fertilizer with adjuvant - IPM practices - Life saving irrigation - Mulching - Thinning - Clipping of leaves in maize		
	Lowland	Rice-Wheat-Greengram Rice: Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343	- Spray of potassic fertilizer with adjuvant - IPM practices - Life saving irrigation - Mulching - Thinning		

		HP-1731, HD-2824			
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Resource management technologies

23. Bamboo boring with refinement to irrigate cucurbits in stress situation
24. Rain water harvesting through farm pond and roof top water harvesting
25. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
26. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
27. Desilting and renovation of defuncted check dam
28. Ridge and furrow method in different crops
29. Line sowing of mustard through seed drill
30. Mulching with organic residues in vegetables like pointed gourd
31. Water harvesting through construction of farm ponds
32. Green manuring in dhaincha in paddy
33. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	KISHANGANJ
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1746.2	More than 19%	Less than 1414.422
June	342.6		
July	583.9		
August	403.3		
September	416.4		

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

Irrigation info:

Net irrigated area:	63906	Gross irrigated area:	143511
Net Rainfed area	53691	Gross rainfed area	44294

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	63598	142813
Tanks	-	-
Other sources	308	698

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	80019	24033	55986
2	Jowar	-	-	
3	Maize	47073	47073	0
4	Bajra	-		
5	Ragi	77		77

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	37		37
2	Groundnut	-		
3	Sesamum	204		204
4	Soyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	13838		13838
3	Mesta	1353		1353
4	Sunhemp	-		

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	55		55
2	Tobacco	-		
3	Guar seed	-		
4	Fodder crops	-		

Crop Plan- Beginning of the season

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 ^e
Delay by 4 weeks	Upland (Light tex. soil)	Rice- Wheat Rice-Maize	Rice-Wheat Rice- Prefer Medium to short duration varieties like Saroj (100-110d), Birsadhan-201 (100-115d)	Direct seeding of rice with medium duration drought tolerant varieties with pre emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for effective weed management.	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Upland (Med. tex. soil)	Rice- Wheat Rice-Maize			

				▪ Normal sowing of rice can be used with enhanced NPK to boost the early vegetative growth in late plantings under sufficient moisture • Interculture for timely weed control in direct seeded rice	
	Medium land (Med. Tex. soil)	Rice – Wheat	Rice-Wheat Rice - Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati, Rajendra Suwasni, Rajshree, Prabhat	• Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Lowland (heavy tex. soil)	Rice – Wheat	Rice – Wheat Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1	• Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and Lowlands • Raise staggered community nursery preferably with Medium duration varieties in mid and lowlands • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. • Para grass cultivation for fodder in Lowland • Normal package of practices	

				• Timely interculture for weed control in direct seeded rice • Life saving irrigation	
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Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm))	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Upland (Light tex. soil)	Rice-Potato	• Gap filling of existing crop • Postponement of top dressing • Spray (1%) Urea on the crops	• Inter cultivation • Mulching • Conservation tillage • Foliar application of 2% MOP • Life saving irrigation	
	Upland (Med. tex. soil)	Rice –Wheat			
	Medium land (Med. Tex. soil)	Rice-wheat-Green gram			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Upland (Light tex. soil)	Vegetables – Wheat	Postpone the top dressing	• Inter cultivation • Mulching • Conservation tillage • Life saving irrigation	
	Upland (Med. tex. soil)	Rice-Wheat	Clipping of maize leaves		
	Medium land (Med. Tex. soil)	Maize-wheat			
	Lowland (Heavy tex. soil)	Rice-wheat-green gram			

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Upland (Light tex. Soil and Med. tex. soil)	Rice-Wheat	• Thinning • Foliar application of 2% MOP	Open the furrow during evening and left furrow open overnight and plank in the next	Seeds from BRBN, BAU, Sabour, NSC, TDC

	Medium land: (Med. Tex. soil)	Maize-wheat	• Mulching • Life saving irrigation	morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables	
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Resource management technologies

34. Bamboo boring with refinement to irrigate cucurbits in stress situation
35. Rain water harvesting through farm pond and roof top water harvesting
36. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
37. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
38. Desilting and renovation of defuncted check dam
39. Ridge and furrow method in different crops
40. Line sowing of mustard through seed drill
41. Mulching with organic residues in vegetables like pointed gourd
42. Water harvesting through construction of farm ponds
43. Green manuring in dhaincha in paddy
44. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	NALANDA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	852.8	More than 19%	Less than 690.768
June	119.2		
July	300		
August	219.5		
September	214.1		

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

Irrigation info:

Net irrigated area:	116898	Gross irrigated area:	236672
Net Rainfed area	52149	Gross rainfed area	18440

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	15199	30767
Wells	99077	200586
Tanks	-	-
Other sources	2622	5319

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	112509	108086	4423
2	Jowar	-	-	
3	Maize	6204	5010	1194
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	224		224
2	Groundnut	-		
3	Sesamum	-		
4	Soyabean	-		
5	Sunflower	74	74	0
6	Castor	-		

Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	203	203	0
2	Tobacco	-		
3	Guar seed	-		108
4	Fodder crops	1510	1402	108

Crop Plan- Beginning of the season

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 3 rd week of July	Upland	Rice –Wheat Rice-Chickpea Rice-Vegetables Rice-Lentil Rice-Mustard	Short duration Rice – Wheat Rice – Lentil/ Rice – Linseed Rice – Mustard/ Rice – Potato Rice – Végétales Rice- Prefer Medium to short duration varieties like Saroj (100-110d), Birsadhan-201 (100-115d) Pigeonpea – Bahar, Narendra I Blackgram- T-9, Pant 30	Direct seeding of rice with medium duration drought tolerant varieties with pre-emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for effective weed management. Normal sowing of rice can be used with enhanced NPK to boost the early vegetative growth in	Seeds from BRBN, BAU, Sabour, NSC, TDC

			Maize – Deoki . Ganga -2	late plantings under sufficient moisture ▪ Interculture for timely weed control in direct seeded rice	
	Medium land	Rice –Wheat	Rice-Late Wheat Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita	Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Lowland	Rice –Wheat Rice – Pulses Rice – Oil seeds Rice – Vegetables Rice – Potato	Rice- Wheat Rice – Lentil Rice – Linseed Rice – Vegetables Rice – Mustard Rice – Potato Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1	- Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands - Raise staggered community nursery preferably with short duration varieties in mid and lowlands - Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing.	

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	Upland Medium land Lowland	Rice –Wheat Rice-Lentil /Chickpea Rice-Vegetables Rice-Linseed Rice-Mustard Rice: Prabhat, Dhanlaxmi, Richharia, Turanta, Saro Rajendra Swashini,Rajshree	Life saving irrigation, Inter cultivation	Mulching for moisture conservation; Life saving irrigation at critical stages	
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Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Upland Medium land Lowland	Rice –Wheat Rice-Lentil /Chickpea Rice-Vegetables Rice-Linseeds Rice-Mustard	Life saving irrigation, Weed management	Mulching for moisture conservation, Life saving irrigation	

Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Upland Medium land Lowland	Rice –Wheat Rice-Lentil /Chickpea Rice-Vegetables Rice-Linseed Rice-Mustard	Life saving irrigation Inter cultivation, Weed management, Mulching	Wheat/ Rabi Maize/ Pulses /Oilseeds/ Vegetables etc.	

Resource management technologies

45. Bamboo boring with refinement to irrigate cucurbits in stress situation
46. Rain water harvesting through farm pond and roof top water harvesting
47. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
48. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
49. Desilting and renovation of defuncted check dam
50. Ridge and furrow method in different crops
51. Line sowing of mustard through seed drill
52. Mulching with organic residues in vegetables like pointed gourd
53. Water harvesting through construction of farm ponds
54. Green manuring in dhaincha in paddy
55. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	NAWADA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	826.5	More than 19%	Less than 669.465
June	124.3		
July	276.6		
August	227.6		
September	198		

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

Irrigation info:

Net irrigated area:	65970	Gross irrigated area:	122374
Net Rainfed area	54253	Gross rainfed area	15159

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	18601	34512
Wells	44856	83212
Tanks	-	-
Other sources	2513	4650

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	68883	61663	7220
2	Jowar	-	-	
3	Maize	533	437	96
4	Bajra	-		
5	Ragi	117	3	114

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	1001		1001
2	Groundnut	598	47	551
3	Sesamum	103		103
4	Soyabean	-		
5	Sunflower	19	19	0
6	Castor	-		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	-		
2	Jute	-		
3	Mesta	-		
4	Sunhemp	39		39

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	-		
2	Tobacco	-		
3	Guar seed	-		364
4	Fodder crops	493	129	364

Crop Plan- Beginning of the season

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 ^e
Delay by 4 weeks 3 rd week of July	Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Vegetable Maize: Dewki, Ganga -2 Tomato: S-27 , Navodaya Pusa Rubi Chilli: Pusa Jwala , Pusa Sadabahar , G34 Brinjal: Swarna Pratisha, PPI , Pant Smrat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039	- Normal package of practices - Life saving irrigation	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

			Horsegram: Local		
	Medium land Deep Sandy loam to Clay loam	Rice- Wheat- Greengram/ Rice – Vegetable/ Rice-Wheat	Rice-Wheat – Greengram/ Rice – Vegetable Rice: Rajendra Bhagawati, Rajendra Suwasni,, Prabhat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139, Pusa Vishal , SML -668 Cabbage – Golden Acre, Pride of India Cauliflower- Patna early ,Hajipur early , Kuwan	• Full basal dose of NPK • Life saving irrigation • Application of Potash • Seedling raising by Dapog method • Balanced dose of fertilizer	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil/Chickpea Fallow – Lentil / Chickpea	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil /Chickpea Rice: Sita , RM -1 Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343, HP-1731 , HD 2824 , K-307 Chickpea: C235 , P256 Lentil – DPL 62 , PL639, Arun	• Enhanced dose of nitrogen with full basal dose of NPK at transplanting • Old age rice seedling of 40-45 days may be used with four seedling per hill with close spacing	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At vegetative stage	Upland	Pigeonpea- Pigeonpea / Maize – Vegetables/ Maize – Toria Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki Pusa early hybrid Macca-3 Toria: RAU TS-17, Panchali , Bhawani	- Gap filling of existing crop - Postponement of top dressing	- Inter culturing - Mulching through weeds, - Conservation tillage - Life saving irrigation - Spray of potassic fertilizer with adjuvant - Spray (1%) Urea on the crops and Zinc sulphate	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Greengram/ Rice – Vegetable / Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea: Pusa-236, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki Pusa early hybrid Macca-3 Greengram: SML-6-68, Pusa Vishal, Samarat	- Gap filling of existing crop - Postponement of top dressing - Protective spray of pesticides with adjuvant against BLB,	- Inter culturing - Mulching through weeds - Conservation tillage - Life saving irrigation - Spray of potassic fertilizer with adjuvant - Spray (1%) Urea and zinc sulphate on the crops	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At flowering/ fruiting stage	Upland	Pigeonpea- Pigeonpea/ Maize – Vegetable/ Maize – Toria Pigeonpea – Bahar, Pusa-9	- IPM practices - Spray of pesticides with spreader	- Interculturing - Mulching through weeds	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		Narendra Arhar-I Maize - Shaktiman-1,2,3,4,5,Suwan, Ganga-11, Deoki Pusa early hybrid Macca-3 Torla- RAU TS-17, Panchali , Bhawani		- Conservation tillage - Life saving irrigation - Spray of potassic fertilizer with adjuvant	
	Medium land	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Chickpea/ Rice – Vegetable Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea :Pusa-236, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4,5,Suwan, Ganga-11, Deoki Pusa early hybrid Maca-3	- IPM practices - Clipping of maize leaves - Spray of pesticides with spreader	- Interculturing - Mulching through weeds - Conservation tillage - Life saving irrigation - Spray of potash and nitrogen fertilizer with adjuvant	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland	Rice-Wheat-Greengram/ Rice – Vegetable/ Rice – Wheat/ Rice – Lentil /Chickpea Fallow – Lentil / Chickpea Rice:Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat: HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea: Pusa-236, KPG-39 (Uday) Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Greengram: SML-6-68, Pusa Vishal, Samarat	- IPM practice - Life Saving Irrigation	- Inter culturing - Mulching through weeds - Life saving irrigation - Conservation tillage - Spray of potassic fertilizer with adjuvant,	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

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

	Sandy to Sandy loam	Pigeonpea- Pigeonpea/ Maize – Vegetables/ Maize – Toria Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Maize – Shaktiman-1,2,3,4, 5Suwan, Ganga-11, Deoki, Pusa early hybrid Macca-3 Toria- RAU TS-17, Panchali Bhawani	• IPM practices • Spray of pesticides with spreader	• Open the furrow during evening and leave furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like Wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Sandy loam – Clay Loam	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Chickpea/ Rice – Vegetable Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea :Pusa-236, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki Pusa early hybrid Maca-3	• Life saving irrigation • Gap filling	• Open the furrow during evening and leave furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like Wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland	Rice-Wheat-Greengram/ Rice – Vegetable/ Rice – Wheat/ Rice – Lentil /Chickpea Fallow – Lentil / Chickpea Rice:Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat: HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea: Pusa-236, KPG-39	• IPM practice • Life Saving Irrigation	• Open the furrow during evening and leave furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like Wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		(Uday) Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Greengram: SML-6-68, Pusa Vishal, Samarat		moisture through seepage	
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Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in canals due to low rainfall	NA				

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

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /Delayed onset of monsoon	Upland Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Toria/ Maize – Vegetable/ Maize-Horsegram Maize: Deoki, Ganga Tomato:S-27 , Navodaya , Pusa Rubi Chilli – Pusa Jwala , Pusa Sadabahar , G34 Brinjal - -Swarna Pratisha, PPI Pant Smarat Pigeonpea: Bahar, Pusa-9	- Life saving irrigation - Spray of potassic fertilizer with adjuvant - Mulching - Application of organic manure and vermicompost	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			Narendra Arhar-I , ICPL 88039 Horsegram: Local Torla: Panchali , Bhavani		
	Medium land Deep Sandy loam to clay loam	Rice- Wheat- Greengram/ Rice –Vegetable/ Rice – Wheat	Rice-Wheat – Greengram/ Rice – Vegetable/ Rice – Wheat Rice: Rajendra Bhagawati, Rajendra Suwasni Prabhat , Turanta , Shusk Samrat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139 Pusa Vishal , SML -668 Cabbage: Golden Acre Pride of India Cauliflower: Patna early , Hajipur early , Kuwan	- Full basal dose of NPK - Life saving irrigation - Application of Potash	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall	Upland Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize – Vegetables/ Maize – Toria	Pigeonpea – Pigeonpea/ Maize – Toria/ Maize – Vegetable/ Maize-Horsegram Maize: Deoki, Ganga Tomato:S-27 , Navodaya , Pusa Rubi Chilli – Pusa Jwala , Pusa Sadabahar , G34 Brinjal - -Swarna Pratisha, PPI Pant Smarat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039 Horsegram: Local Torla: Panchali , Bhavani	- Life saving irrigation - Spray of potassic fertilizer with adjuvant - Mulching - Application of organic manure and vermicompost	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
	Medium land Deep Sandy loam to Clay loam	Rice- Wheat- Greengram/ Rice –Vegetable/ Rice – Wheat	Rice-Wheat – Greengram/ Rice – Vegetable/ Rice – Wheat Rice: Rajendra Bhagawati, Rajendra Suwasni, Shusk Smrat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139, Pusa Vishal, SML -668 Cabbage – Golden Acre Pride of India Cauliflower- Patna early ,Hajipur early, Kuwan	▪ Full basal dose of NPK ▪ Life saving irrigation ▪ Application of Potash	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil/Chickpea Fallow – Lentil /Chickpea	Rice – Wheat Rice – Wheat – Greengram/ Rice – Lentil /Chickpea Rice: Sita , RM -1, Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343, HP-1731 , HD 2824 , K-307 Lentil: DPL 62, PL639 Chickpea: C235 , P256	• Enhanced dose of nitrogen with full basal dose of NPK at transplanting • Old age rice seedling of 40-45 days may be used with four seedling per hill with close spacing	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Resource management technologies

56. Bamboo boring with refinement to irrigate cucurbits in stress situation
57. Rain water harvesting through farm pond and roof top water harvesting
58. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
59. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
60. Desilting and renovation of defuncted check dam
61. Ridge and furrow method in different crops
62. Line sowing of mustard through seed drill
63. Mulching with organic residues in vegetables like pointed gourd
64. Water harvesting through construction of farm ponds
65. Green manuring in dhaincha in paddy
66. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	PATNA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	886.9	More than 19%	Less than 718.389
June	130.2		
July	308.9		
August	222.9		
September	224.9		

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

Irrigation info:

Net irrigated area:	81626	Gross irrigated area:	170680
Net Rainfed area	83899	Gross rainfed area	58540

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	22037	44531
Wells	58773	124001
Tanks	-	-
Other sources	816	2148

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	74207	64674	9533
2	Jowar	10	10	0
3	Maize	5940	3480	2460
4	Bajra	69		69
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	989	39	950
2	Groundnut	-		
3	Sesamum	1	1	0
4	Soyabean	-		
5	Sunflower	22	22	0
6	Castor	-		

Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	30		30
2	Tobacco	-		
3	Guar seed	-		1806
4	Fodder crops	3022	1216	1806

Crop Plan- Beginning of the season

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 3 rd week of July	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetable/ Rice –Potato	Short duration Rice –Wheat/ Rice –Lentil/ Rice –Linseed/ Rice –Mustard/ Rice –Potato/ Rice –Vegetables Rice- Prefer Medium to short duration varieties like Saroj (100-110d), Birsa Dhan-201 (100-115d) Blackgram- T-9, Pant 30 Maize – Deoki . Ganga -2	• Direct seeding of rice with medium duration drought tolerant varieties with pre emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for	Seeds from BRBN, BAU, Sabour, NSC, TDC

				effective weed management. ▪ Normal sowing of rice can be used with enhanced NPK to boost the early vegetative growth in late plantings under sufficient moisture ▪ Interculture for timely weed control in direct seeded rice	
	Medium land	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato	Medium duration Rice – Late Wheat Rice –Lentil/ Rice –Linseed/ Rice –Mustard/ Rice –Potato/ Rice –Vegetables Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita	• Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Lowland	Rice –Wheat/ Rice-Pulses/ Rice-Vegetables/ Rice-Oilseed/ Rice-Potato	Medium duration Rice – Wheat/ Lentil Rice – Linseed/Vegetables/Mustard / Potato Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta Rajendra Mashuri	• Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands • Raise staggered community	

				nursery preferably with short duration varieties in mid and lowlands • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. • Enhanced dose of nitrogen with full basal dose of NPK at the time of transplanting to boost the early vegetative growth in late plantings under sufficient moisture • Timely interculture for weed control in direct seeded rice • Life saving irrigation	
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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	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato Rice: Prabhat, Dhanlaxmi, Richharia, Turanta,	• Gap filling of existing crop • Postponement of top dressing	• Inter culturing • Mulching • Conservation tillage • Foliar spray with (1%) MOP • Life saving irrigation	

	Medium land	Rice –Wheat/ Rice –Pulses/ Rice –Oilseed/ Rice –Vegetable/ Rice –Potato Rice : Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh			
	Lowland	Rice –Wheat/ Rice –Pulses/ Rice –Oilseeds/ Rice –Vegetables/ Rice –Potato Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta, Rajendra Mashuri			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Upland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea Rice: Prabhat, Richharia , Dhanlaxmi, Turanta	- Postponement of top dressing of nutrients - Life saving irrigation	- Interculture - Foliar application with 2% MOP - Mulching - Conservation tillage - Life saving irrigation	
	Medium land	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea Rice: Prabhat, Richharia , Dhanlaxmi, Turanta			
	Lowland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea Rice: Prabhat, Richharia ,			

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation

	Upland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea/ Rice-Mustard/ Rice-Rai/ Rice-Linseed Rice:Prabhat, Richharia , Dhanlaxmi, Turanta	- Foliar application with 2% MOP - Mulching - Life saving irrigation	For rabi land preparation open the furrow during evening, leave it open overnight and plank next morning before sunrise for growing early rabi crops like Wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables etc.	
	Medium Land	Rice-Wheat/Lentil/ Chickpea/-Mustard/ Rai/Linseed Rice- Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh			
	Lowland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea/ Rice-Mustard/ Rice-Rai/ Rice-Linseed Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta, Rajendra Mashuri			

Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato	Rice (Short duration) – Late sown Wheat/Pulses/Mustard/Potato Vegetables –Wheat Rice:Prabhat, Dhanlaxmi, Richharia, Turanta	❖ Life saving irrigation	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium Land	Rice –Wheat/ Rice –Pulses/ Rice –Oilseed/ Rice –Vegetables/ Rice –Potato	Rice (Medium duration) – Late sown wheat/Pulses/Mustard/Potato Vegetables –Wheat Rice:Prabhat, Dhanlaxmi, Richharia, Turanta,	❖ Life saving irrigation	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Upland	Rice –Wheat/ Rice –Lentil/Chickpea/ Rice –Rai/Linseed/ Rice –Vegetables/ Rice –Potato	Rice (Short duration) – Wheat/ Vegetable –Wheat Rice: Prabhat, Dhanlaxmi, Richharia, Turanta,	❖ Dapog method for nursery raising ❖ Life saving irrigation	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium Land	Rice –Wheat/ Rice –Pulses/ Rice –Oilseed/ Rice –Vegetable/ Rice –Potato	Rice (Medium duration) – Late sown Wheat/ Rice- Vegetable/ Rice–Wheat Rice: Rajendra Bhagawati, Rajendra Suwasini, Rajshree, Prabhat		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Not Applicable				

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland/Medium land/Low land	Rice – Wheat/ Rice –Lentil/ Rice –Chickpea/ Rice –Oilseeds	Cucurbits-Wheat/ Blackgram-Wheat/ Fodder (Sorghum + Fenugreek)-Wheat/ Sesame-Wheat/ Horsegram-Wheat Sesame:Krishna, Pragati Blackgram: T-9, Navin, Pant urd30 , 19	❖ Mulching for moisture conservation ❖ Use of FYM/compost/ vermicompost ❖ Mechanical weeding	-

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater	Upland/Medium land	Rice – Wheat	Cucurbits- Wheat/	❖ Mulching for moisture conservation	Seeds from BRBN, BAU,

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
recharge due to low rainfall			Blackgram- Wheat/ Fodder (Sorghum + Fenugreek)- Wheat/ Sesame-Wheat/ Horsegram- Wheat/ Medicinal Plant- Tulsi-Rabi Maize/ Wheat Sesame:Krishna, Pragati Blackgram: T-9, Navin, Pant Blackgram-30 , Pant Blackgram- 19 Horsegram: DB- 7, BR-5, BR-10, Coimbatore-1 Sorghum: P-C 23, M-P Chari Mithi Sudan Tulsi – Cimsomaya	- Foliar application with 2% MOP in standing crops ❖ Use of FYM/compost/Vermicompost ❖ Mechanical weeding	Sabour, NSC, TDC

Resource management technologies

Resource management technologies

67. Bamboo boring with refinement to irrigate cucurbits in stress situation
68. Rain water harvesting through farm pond and roof top water harvesting
69. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
70. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
71. Desilting and renovation of defuncted check dam
72. Ridge and furrow method in different crops
73. Line sowing of mustard through seed drill
74. Mulching with organic residues in vegetables like pointed gourd
75. Water harvesting through construction of farm ponds
76. Green manuring in dhaincha in paddy
77. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	SAMASTIPUR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	945.7	More than 19%	Less than 766.017
June	158.4		
July	300		
August	240.8		
September	246.5		

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

Irrigation info:

Net irrigated area:	112136	Gross irrigated area:	246657
Net Rainfed area	63206	Gross rainfed area	55549

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	111472	245538
Tanks	-	-
Other sources	664	1119

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	86022	72148	13874
2	Jowar	-	-	
3	Maize	65002	52145	12857
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	989	375	614
2	Groundnut	-		
3	Sesamum	427	75	352
4	Soyabean	28	28	0
5	Sunflower	2	2	0
6	Castor	6		

Fibre

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Cotton	1	1	0
2	Jute	36		36
3	Mesta	-		
4	Sunhemp	97		97

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	5753	2316	3437
2	Tobacco	4032	3609	423
3	Guar seed	-		4030
4	Fodder crops	4186	156	4030

Crop Plan- Beginning of the season

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 2 nd week of July	Very deep, calcareous fine silty soil, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize	Rice(short duration) – Wheat Vegetable-Wheat Pigeonpea+Blackgram - Maize + Sponge goBlackgram-Wheat Sesame/ Blackgram - Wheat Rice- Prabhat, Richharia, Dhanlaxmi, Turanta,	- Direct seedling of rice can also be made. - Life saving irrigation - Old age seedling of 30-35 days early rice can also be used along with balance dose of NPK	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.

			Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Pigeonpea – Bahar, Pusa-9 Narendra Pigeonpea-I Blackgram - T-9, Navin, Pant Blackgram-30, Pant Blackgram-19 Sesame – Krishna, Pragati		
	2. Mid land	Rice-Wheat	Mid duration rice Rice up to 125-130 days. Rice - Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santosh Wheat - HD-2733, PBW-343, HP-1731, HD-2824	- Moisture conservation measures - Full basal dose of NPK - Application of potash with adjuvant	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.
	3. Low land	Rice-Wheat	Mid duration rice Rice up to 125-130 days. Rice - Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri Wheat - HD-2733, PBW-343, HP-1731, HD-2824	- Enhanced dose of nitrogen with full basal dose of NPK at transplanting - Old age seedling of 35 -40 days may be used - Three seedling per hill having closer spacing should be transplanted - Moisture conservation through mulching - Interculturing - Dapog seedling should be used	Seeds from RAU, Pusa, NSC, TDC, BRBN etc.

Condition			Suggested Contingency measures		
Mid season drought (long dry spell,	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation*

consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Very deep, calcareous fine loamy, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Rice -Prabhat, Dhanlaxmi, Richharia, Turanta, Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman- 1,2,3,4, 5 Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3 Rabi Maize - Saktiman-1,2,3,4,5 Laxmi, Deoki, Rajendra Hybrid -1,2		• Interculturing • Mulching through weeds for moisture conservation • Spray potassic fertilizer with adjuvant at vegetative stage	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Mid land	Rice-wheat Rice - Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra kasturi, Santosh Wheat - HD-2733, PBW-343, HP-1731, HD-2824			
	Low land	Rice-Wheat Rice - - Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri Wheat - HD-2733, PBW-343, HP-1731, HD-2824			

		Green Gram- SML-6-68, Pusa Vishal, Samarat			
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Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
At flowering/ fruiting stage	Up land	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea- Rice-Prabhat, Dhanlaxmi, Richharia, Turanta, Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4,5 Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3 Rabi Maize- Saktiman-1,2,3,4,5 Laxmi, Deoki, Rajendra Hybrid -1,2 Pigeonpea – Bahar, Pusa-9, Narendra Pigeonpea-I	• IPM practices • Spray of pesticides with spreader	• Interculturing • Mulching through weeds • Life saving irrigation • Application of potassic fertilizer with adjuvant	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium land	Rice-Wheat Maize-Wheat Red Gram-Greengram Rice- Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santosh Maize - Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Wheat- HD-2733, PBW-343, HP-1731, HD-2824	• IPM practices • Clipping of maize leaves • Spray of pesticides with spreader		

		Pigeonpea- Bahar, Narendra , Pigeonpea-1, Sharad Greengram- Samrat, Pusa Vishal, SML 668,			
	Low land	Rice-wheat Rice- Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta Rajendra Mashuri Wheat- HD-2733, PBW-343, HP-1731, HD-2824	• IPM practice • Spray of pesticides with spreader		

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Up land	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea- Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, 5 Suwan Ganga-11, Deoki, Pusa early hybrid Makka-3 Rabi Maize- Saktiman-1,2,3,4,5 Laxmi, Deoki, Rajendra Hybrid -1,2 Pigeonpea – Bahar, Pusa-9, Narendra, Arhar-I	• Application of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching	• Open the furrow during evening and leave it open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium land	Rice-wheat Rice- Rajendra Bhagawati, Rajendra Suwasini			

		Saroj, Rajendra Kasturi, Santosh Wheat - HD-2733, PBW-343, HP-1731, HD-2824			
	Low land	Rice-wheat Rice - Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri Wheat - HD-2733, PBW-343, HP-1731, HD-2824			

Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall		Not applicable			

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	1) Farming situation:	Not applicable			

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment		Not applicable			

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1.Upland	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-	Short duration rice –Wheat Pigeonpea- Blackgram/Sesame/Horsegram- Wheat Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Pigeonpea – Bahar, Pusa-9 Narendra Pigeonpea-I Sesame- Krishna, Pragati Blackgram- T-9, Navin, Pant Urd-30 , Pant Urd-19 Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Horsegram- DB-7, BR-5, BR-10, Coimbatore-1	• Dapog nursery for rice • Direct seeding of rice • Life saving irrigation • Application of potassic fertilizer with adjuvant • Mulching • Application of organic manure and vermicompost	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium Land	Rice-Wheat Rice - Mustard Rice - Pulses Rice - Rabi maize	Medium duration rice- Wheat Rice-Rabi maize Sesame –Wheat Rice - Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Pigeonpea – Bahar, Pusa-9 Narendra, Arhar-I Sesame- Krishna, Pragati		
	Low land	Rice-Wheat Rice- Mustard Rice- Pulses	Rice-Wheat Rice - Lentil Rice - Mustard Rice- Linseed Rice- Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri Mustard- 66-197-3, Rajendra Sarson-I Lentil- PL-406, Malika, Arun Linseed- Shubra, Garima, Sweta Wheat- HD-2733, PBW-343, HP-1731, HD-2824		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Very deep, calcareous fine loamy, loamy surface texture	Rice-Wheat Vegetable-Wheat Vegetable-Vegetable Rice-Rabi maize Maize-Wheat Maize-Rabi maize Pigeonpea-	Sesame-Wheat Black gram - Wheat Pigeonpea-Greengram Sesame – Krishna, Pragati Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Pigeonpea – Bahar, Pusa-9 Narendra Arhara-I Greengram – Samrat, Pusa Vishal, SML 668, T-44 Blackgram - T-9, Navin, Pant Moong-30 , Pant Moong-19	- Life saving irrigation - Spray of potassic fertilizer with adjuvant - Use of organic manure and vermicompost	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Mid land	Rice –Wheat Rice- Pulse Rice- Oilseed Maize-Rabi maize Rice-Rabi maize	- Rice –Wheat - Pigeonpea- - Greengram -Wheat - Coarse cereal-Wheat Rice - Rajendra Bhagawati, Rajendra Suwasini Saroj, Rajendra Kasturi, Santosh Wheat - HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Greengram – Samrat, Pusa Vishal, SML 668, PDM-44, T-44 Pigeonpea – Bahar, Pusa-9	- Zero tillage for wheat and rice - Clipping of maize leaves - Direct sowing of rice - Life saving irrigation - Mulching for moisture conservation - Application of potassic fertilizer wit adjuvant	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

			Narendra Arhar-I		
	Low land	Rice –Wheat Rice- Pulses	• Rice-Wheat • Rice-Lentil/Chickpea Rice- Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta Rajendra Mashuri Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Chickpea- Pusa-236, KPG-39 (Uday) Pusa-372, SG-2 Lentil- PL-406, Malika, Arun		

Resource management technologies

78. Bamboo boring with refinement to irrigate cucurbits in stress situation
79. Rain water harvesting through farm pond and roof top water harvesting
80. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
81. Zero till wheat and potato sowing using zero till seed cum fertilizer drill
82. Desilting and renovation of defuncted check dam
83. Ridge and furrow method in different crops
84. Line sowing of mustard through seed drill
85. Mulching with organic residues in vegetables like pointed gourd
86. Water harvesting through construction of farm ponds
87. Green manuring in dhaincha in paddy
88. Raised bed method of sowing of potato variety Kufri Pukhraj

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	SHEIKHPURA
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	818	More than 19%	Less than 662.58
June	130.1		
July	290.3		
August	194		
September	203.6		

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

Irrigation info:

Net irrigated area:	25364	Gross irrigated area:	50357
Net Rainfed area	20147	Gross rainfed area	5433

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	1305	2594
Wells	18865	36962
Tanks	5118	10655
Other sources	76	146

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	23983	23983	0
2	Jowar	-	-	
3	Maize	515	374	141
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	174		174
2	Groundnut	-		
3	Sesamum	-		
4	Soyabean	-		
5	Sunflower	-		
6	Castor	-		

Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	19		19
2	Tobacco	-		
3	Guar seed	-		127
4	Fodder crops	128	1	127

Crop Plan- Beginning of the season

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 2 nd week of July	Up land Medium to low deep soil Sandy loam to clay loam soil	Maize-Fallow Pigeonpea- Fallow	Maize-Pigeonpea Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3	- Normal package of Practices - Gap filling - Balanced dose of NPK	Seeds from BRBN, RAU, Pusa, NSC, TDC

	Mid land	Rice- Wheat Rice- Maize	Rice –Wheat Rice-Maize Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130- 135d), Rajendra Bhagwati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita	Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Low land	Rice- Wheat Rice- Maize- Greengram	Rice- Wheat Rice- Maize- Green gram Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1	Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in	

				mid and low lands • Raise staggered community nursery preferably with short duration varieties in mid and lowlands • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. • Enhanced dose of nitrogen with full basal dose of NPK at the time of transplanting to boost the early vegetative growth in late plantings under sufficient moisture • Timely interculture for weed control in	
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				direct seeded rice Life saving irrigation	
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	Up land	Maize-Fallow	- Life saving irrigation - Gap filling of existing crop - Gap filling of existing crop - Postponement of top dressing - Life saving irrigation	- Foliar application of 2% MOP - Mulching for moisture conservation - Conservation tillage - Mulching through weeds, - Foliar application of 2% MOP - Foliar application of 2% MOP	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Medium to low deep soil Sandy loam to clay loam soil	Pigeonpea-Fallow			
	Mid land	Rice- Wheat Rice- Maize			
	Low land	Rice- Wheat Rice- Maize- Greengram			
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 flowering/ fruiting stage	Up land Medium to low deep soil Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	- Gap filling of existing crop - Postponement of top dressing - Life saving irrigation	- Foliar application of 2% MOP - Mulching through weeds & residue	
	Mid land	Rice- Wheat Rice- Maize			
	Low land	Rice- Wheat Rice- Maize- Greengram			
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
	Up land Medium to low deep soil Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	- Foliar application of 2% MOP - Mulching - Clipping of leaves in maize - Life saving irrigation	- Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like Gram, Lentil, Linseed. - Stored water to be used at critical stage of growth of LSI - Clean irrigation channel for preventing loss of moisture through seepage - Zero tillage sowing of wheat	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Mid land	Rice- Wheat Rice- Maize			
	Low land	Rice- Wheat Rice- Maize- Greengram			

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Upland Canal irrigated	Rice- Wheat Rice- Potato Rice- Maize	Mustard- Greengram Maize- Potato Maize- Lentil Mustard- 66-197-3, Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3	• Use of mulches • Life saving irrigation	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Upland Canal irrigated	Rice- Wheat- Greengram Rice- Potato- Summer vegetables Rice- Maize- Greengram	Rice- Wheat Rice- Potato Rice- Maize Rice- Prabhat, Dhanlaxmi, Richarria, Saroj	• Foliar application of 2% potash • Life saving irrigation	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Low land Canal irrigated	Rice- Wheat- Greengram Rice- Potato Rice- Onion	Rice- Wheat Rice- Lentil/ Linseed Rice- Chickpea Rice- Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Upland Canal irrigated	Rice- Wheat- Greengram Rice- Potato- Summer vegetables Rice- Maize- Greengram	Rice- Wheat Rice- Potato Rice- Maize Rice- Prabhat, Dhanlaxmi, Richarria, Saroj	- Foliar application of 2% MOP in standing crops - Life saving irrigation	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Low land Canal irrigated	Rice- Wheat- Greengram Rice- Potato Rice- Onion	Rice- Wheat Rice- Lentil/ Linseed Rice- Chickpea Rice- Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Not Applicable				
Insufficient groundwater recharge due to low rainfall					

Resource management technologies

1. Rain water harvesting through farm pond
2. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
3. Zero till wheat sowing using zero till seed cum fertilizer drill
4. Desilting and renovation of defuncted check dam
5. Ridge and furrow method in different crops
6. Line sowing of mustard through seed drill
7. Mulching with organic residues in vegetables
8. Water harvesting through construction of farm ponds
9. Green manuring in dhaincha in paddy

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	SHEOHAR
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1008.7	More than 19%	Less than 817.047
June	179.1		
July	344.4		
August	249.6		
September	235.6		

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

Irrigation info:

Net irrigated area:	17161	Gross irrigated area:	27164
Net Rainfed area	8087	Gross rainfed area	20250

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	17161	27164
Tanks	-	-
Other sources	-	-

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	17255	6332	10923
2	Jowar	-	-	
3	Maize	1589	1584	5
4	Bajra	-		
5	Ragi	-		

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	15		15
2	Groundnut	-		
3	Sesamum	16	7	9

4	Soyabean	-		
5	Sunflower	4	3	1
6	Castor	-		

Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	1671	311	1360
2	Tobacco	17	17	0
3	Guar seed	-		
4	Fodder crops	-		

Crop Plan- Beginning of the season

Condition			Suggested contingency measures.		
Early season drought (delayed onset)	Major Farming situation	Crop/ cropping system	Change in crop/cropping system	Agronomic management	Remarks on Implementation
Delay by 4 weeks 2 nd week of July	Upland Coarse loamy soils	Rice –Wheat Rice-Lentil Rice- Chickpea Rice- Oilseeds Rice-Rabi Maize	Short duration Rice – Wheat Rice-Lentil Rice-Oilseeds Rice-Chickpea Rice--Prabhat, Dhanlaxmi, Richharia, Turanta, Pusa-372, SG-2	- Direct seeding of Rice - Application of fertilizers especially phosphorous and potash to be ensured under late transplanted conditions in severely affected districts Life saving irrigation	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Medium land	Rice –Wheat Rice-Lentil Rice- Chickpea Rice-Oilseed Rice-Pulses Rice -Maize	Rice– wheat/ Blackgram/ Finger millet- Wheat Blackgram- T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19 Finger millet- DB-7, BR-5, BR-10, Coimbatore-1	Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide	

			Rice- Prefer short (early matured) varieties like Birsa Dhan 105 (85-90d), Birsa Dhan-106 (90-95d), Rajendra Bhagavathi (early-upland and midland), Dhanlaxmi , Richharia(<100d), Saroj (100-110d), Birsa Dhan-201 (100-115d)	application use is essential Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands	
	Low land	Rice – Wheat Makhana (in ponds) Var. local	Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1	- Raise staggered community nursery preferably with short duration varieties in mid and lowlands - Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. - Enhanced dose of nitrogen with full basal dose of NPK at the time of transplanting to boost the early vegetative growth in late plantings under sufficient moisture - Timely interculture for weed control in direct seeded rice - Life saving irrigation	

Condition			Suggested contingency measures.		
Mid season drought (long dry spell consecutive 2 weeks rainless (>25 mm))	Major Farming situation	Crop/ cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Upland, Medium land, Lowland	Rice – Wheat/Rabi maize Rice – Lentil/Chickpea/ Khesari Rice – Mustard	Gap filling Spray 1% urea Postponement of top dressing Weed management Life saving irrigation	Interculture Mulching Foliar application with 2% MOP Conservation tillage	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Upland, Medium land, Lowland	Rice – Wheat/Rabi maize Rice – Lentil/Chickpea/ Khesari Rice – Mustard	IPM practices Life saving irrigation	Interculture Mulching Foliar application with 2% MOP Conservation tillage	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Upland, Medium land, Lowland	Rice – Wheat/Rabi Maize Rice – Lentil/Chickpea/ Khesari Rice – Mustard	IPM practices Life saving irrigation	- Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables - Sowing of <i>rabi</i> crops such as Wheat, Lentil, Chickpea, Pea, Mustard (Pusa Mahak, RAU TS17), Linseed (Garima) and Vegetables can be taken up on time for maximizing productivity from lowlands with support from the government for timely supply of inputs and in a way <i>rabi</i> production would	Seeds from BRBN, RAU, Pusa, NSC, TDC

				compensate the production loss during <i>kharif</i> .	
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2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in canals due to low rainfall	Upland Medium land Lowland	Not Applicable			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	Upland Medium land Lowland	Not Applicable			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Non release of water in canals under delayed onset of monsoon in catchment	Upland Medium land Lowland	Not Applicable			

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland	Rice-Wheat/Rabi maize maize Rice – Oilseeds Rice – Pulses Rice – Maize	Rice-Wheat/Rabi maize Pigeonpea – Greengram Blackgram/Finger millet-Wheat Sesame-Wheat Rice-Prabhat, Dhanlaxmi,	Life saving irrigation, , Mulching	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			Richharia, Turanta, Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Blackgram- T-9, Navin, Pant urd-30 , 19 Sesame – Krishna, Pragati		
	Medium Land	Rice-Wheat Rice – Oilseeds Rice – Pulses Rice – Maize	Medium duration of Rice-Wheat Pigeonpea-Greengram Rice- Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santosh Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I	Life saving irrigation, Mulching,	
	Lowland	Rice-Wheat/Oilseeds /Pulses	Medium/long duration Rice-Wheat Rice- Lentil/Chickpea Rice – Mustard Rice - Rajshree, Sakuntala, Satyam, Kishori Rajendra Sweta , Rajendra Mashuri	Life saving irrigation, Mulching	

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall	Upland	Rice-Wheat Rice – Pulses Rice – Oilseeds	Pigeonpea-Greengram Blackgram-Wheat/Rabi maize Sesame - Wheat /Rabi Maize/ Lentil/Chickpea/Mustard Sesame – Krishna, Pragati Blackgram- T-9, Navin, Pant urd-30 ,19	Life saving irrigation, Mulching	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition			Suggested Contingency measures		
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
	Medium land	Rice-Wheat Rice – Pulses Rice – Oilseeds	Rice – Wheat Vegetables – Wheat/Toria/ Mustard Rice- Rajendra Bhagawati, Rajendra Suwasini, Saroj, Rajendra Kasturi, Santosh		
	Lowland	Rice-Wheat Rice – Pulses Rice – Oilseeds	Rice – Wheat Vegetables- Wheat/Toria/ Mustard Rice- Rajendra Bhagawati, Rajendra Suwasini, Saroj, Rajendra Kasturi,Santosh		

Resource management technologies

10. Rain water harvesting through farm pond
11. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
12. Zero till wheat sowing using zero till seed cum fertilizer drill
13. Desilting and renovation of defuncted check dam
14. Ridge and furrow method in different crops
15. Line sowing of mustard through seed drill
16. Mulching with organic residues in vegetables
17. Water harvesting through construction of farm ponds
18. Green manuring in dhaincha in paddy

Actionable Comprehensive Plans for Contingency

State	BIHAR	District	SITAMARHI
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Rainfall info (mm)

Month/season	Normal rainfall (mm)	Expected deficiency, %	Expected rainfall (mm)
June-Sep	1060.3	More than 19%	Less than 858.843
June	188.9		
July	359.3		
August	297		
September	215.1		

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

Irrigation info:

Net irrigated area:	115513	Gross irrigated area:	213626
Net Rainfed area	24850	Gross rainfed area	34521

Source wise irrigation area details (ha)

Source of irrigation	Net	Gross
Canals	-	-
Wells	111022	205200
Tanks	3165	6057
Other sources	1326	2369

Crop Profile (Kharif)

Cereals

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Rice	100664	60957	39707
2	Jowar	-	-	
3	Maize	3448	3448	0
4	Bajra	-		
5	Ragi	40	40	0

Pulses & Oilseeds

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Arhar/ Redgram	53		53
2	Groundnut	-		
3	Sesamum	37		37
4	Soyabean	-		
5	Sunflower	-		

6	Castor	76		
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Fibre

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

Other crops

S.No	Crop name	Total area (ha)	Irrigated area (ha)	Rainfed area (ha)
1	Sugarcane	9211	7965	1246
2	Tobacco	-		
3	Guar seed	-		1094
4	Fodder crops	1094		1094

Crop Plan- Beginning of the season

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 4 weeks 3 rd week of July	Upland heavy loamy soils	Rice- Wheat	Rice-Wheat Rice- Prefer Medium to short duration varieties like Saroj (100-110d), Birsa Dhan-201 (100-115d), Rajendra Bhagwati. Etc.	- Direct seeding of rice with medium duration drought tolerant varieties with pre emergence herbicide application under sufficient soil moisture conditions followed up with a post-emergence weedicide application 20-25 days later for effective weed management. - Normal sowing of rice can be used with enhanced NPK to boost the early vegetative growth in late plantings under sufficient moisture - Interculture for timely weed control in direct seeded rice	- Seeds from RAU, Pusa, NSC, TDC , BRBN etc.

	Medium land	Rice – Wheat	Rice-Wheat Direct sowing / 20d old dapog seedlings with medium to short duration varieties – BR34, Rajendra Dhan-201(130-135d), Rajendra Bhagwati,	Where field is moist, direct seeding of medium duration varieties (125 days) can be done during second fortnight of July in midlands. Post-emergence herbicide application use is essential	
	Lowland	Rice – Wheat Makhana (in ponds) Var. local	Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1 (130-140 days long duration variety should be selected)	- Use mat nursery/ dapog nursery , mat nursery (dapog method) can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August in mid and low lands - Raise staggered community nursery preferably with short duration varieties in mid and lowlands - Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing. - Enhanced dose of nitrogen with full basal dose of NPK at the time of transplanting to boost the early vegetative growth in late plantings under sufficient moisture - Timely interculture for weed control in direct seeded rice - Life saving irrigation	

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

(>2.5 mm) period)					
At vegetative stage	Very deep, calcareous fine loamy soils	Rice-Potato Rice –Wheat	- Gap filling of existing crop - Postponement of top dressing - Foliar application with 2% Urea to boost up the vegetative growth	- Inter culturing - Mulching - Conservation tillage - Foliar spray with (1%) MOP - Life saving irrigation	
		Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj			
	Medium land	Pigeonpea -Greengram Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I	-		
		Rice-Wheat-Green gram Rice- - Rajendra Bhagawati, Rajendra Suwasni Rajshree, Prabhat	- Gap filling of existing crop - Postponement of top dressing		

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Up land	Rice-Wheat Vegetables– Wheat	- Postpone the top dressing - Foliar application with 2% Urea to boost up the vegetative growth	- Interculture - Foliar application with 2% MOP - Mulching - Conservation tillage - Life saving irrigation	
	Medium land	Maize-wheat	- Postpone the top dressing - Foliar application with 2% Urea or MOP		
		Pigeonpea -Greengram	-		
	Lowland	Rice-Wheat-Greengram	- Postpone the top dressing - Foliar application with 2% Urea		

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	Rabi Crop planning	Remarks on Implementation
	Upland calcareous fine loamy soils	Rice-Wheat Rice-Prabhat, Dhanlaxmi, Richharia, Turanta , Saroj	- Foliar application with 2% Urea to boost up the vegetative growth - Mulching	Foliar application with 2% Urea or MOP	

	Medium land	Maize-Wheat Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Pigeonpea Var. Bahar, Narendra Arhar-1	Life saving irrigation	- Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Pulses /Oilseeds/ Vegetables - Sowing of <i>rabi</i> crops such as Wheat, Lentil, Chickpea, Pea, Mustard (Pusa Mahak, RAU TS17), Linseed (Garima) and Vegetables can be taken up on time for maximizing productivity from lowlands with support from the government for timely supply of inputs and in a way <i>rabi</i> production would compensate the production loss during <i>kharif</i>.	
	Lowland	Rice-Wheat-Greengram Rice- Rajshree, Santosh ,Sita, Rajendra Suwasni, Rajendra Sweta			

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
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					
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Upland	Rice-Wheat/Oilseeds/ Pulses/ Rabi maize	Short duration of Rice – Pigeonpea Blackgram /sesame-Wheat Rice-Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj	- Direct seedling of rice - Dapog nursery for rice in midlands and lowlands - Application of organic manure and vermicompost - Mulching - Groundwater to be used for life saving irrigation to upland crops, vegetables and transplanted rice	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium Land	Rice-Wheat/Oilseeds/ Pulses/ Rabi Maize	1. Short duration of Rice-Pigeonpea 2. Blackgram-Wheat 3. Sesame –Wheat Rice- - Rajendra Bhagawati, Rajendra Suwasni, Rajshree, Prabhat		
	Lowland	Rice-Wheat/Oilseeds/ Pulses/ Rabi maize	Short duration Rice-Wheat/ Lentil-Mustard/Linseed Rice- Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Upland	Rice-Wheat/Oilseeds/ Pulses/ Rabi maize	Short duration of Rice- Wheat Pigeonpea/Blackgram/ Sesame- Wheat Rice-Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj	• Dapog nursery for rice • Direct seedling of rice • Mulching • Application of organic manure and vermicompost • Groundwater to be used for life saving irrigation to upland crops, vegetables and transplanted rice	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium Land	Rice-Wheat/Oilseeds/ Pulses/ Rabi maize	Short duration of Rice- Wheat Pigeonpea/Blackgram/ Sesame- Wheat Rice- - Rajendra Bhagawati, Rajendra Suwasni, Rajshree, Prabhat		
	Lowland	Short duration of Rice- Wheat Pigeonpea/Blackgram/ Sesame- Wheat	Short duration Rice- Wheat/Lentil/Mustard/Linseed Rice- Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta		

Resource management technologies

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20. Different methods of rice cultivation Direct seeded rice and SRI method of rice cultivation
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