

STATE: BIHAR

Agriculture Contingency Plan for District: BUXAR

1.0 District Agriculture Profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Northern Plain, Hot Subhumid (Dry) Eco-sub region (9.2)	
	Agro-Climatic Zone (Planning Commission)	Middle Gangetic Plain Region (IV)	
	Agro Climatic Zone (NARP)	South Bihar Alluvial Plain Zone (BI-3)	
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	(Bhojpur, Patna, Nalanda, Nawada, Rohtas, Aurangabad, Gaya, Buxer, Jahanabad, Bhagalpur, Kaimur, Banka, Shekhpura, Munger and Jamui)	
	Geographic coordinates of district headquarters	Latitude	Longitude
		25 ° 58' N	83 ° 98' E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ICAR-Research Complex for Eastern Region, Patna	
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Lalganj, Buxar	
	Name and address of the nearest Agro met Field Unit (AMFU, IMD) for agro-advisories in the Zone	ICAR-Research Complex for Eastern Region, Patna	

1.2	Rainfall	Normal RF(mm) Average (2006-12)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	861.0	2 nd week of June	2 nd week of September
	NE Monsoon(Oct-Dec):	48.5	-	-
	Winter (Jan- March)	44.5		-
	Summer (Apr-May)	38.0	-	-
	Annual	992.0	-	-

1.3	Land use pattern of the district (latest statistics)	Geographical Area	Cultivable area	Forest area	Land under non- agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallow	Other fallow
	Area ('000 ha)	166.9	142.9	0	16.78	-	0.57	0.62	2.27	3.43	0.62

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Sandy loam soils	56.1	39.2
	Loam soils	20.1	14.0
	Clay soils	18.3	12.8
	Clay loam soils	48.4	33.8
	Others (specify):	-	-

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	139.6	123
	Area sown more than once	37.4	
	Gross cropped area	177.08	

1.6	Irrigation	Area (' ha)		
	Net irrigated area	66476 ha		
	Gross irrigated area	74017 ha		
	Rainfed area	73554 ha		
	Sources of Irrigation	Number	Area ('ha)	Percentage of total irrigated area
	Canals	03	47293	
	Tanks	02	02	
	Open wells		2638	
	Bore wells	199	23647	
	Lift irrigation schemes	01	437	
	Micro-irrigation		-	
	Other sources (please specify)			
	Total Irrigated Area	74017(ha)		
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	Yes (80'-320')	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			High levels of arsenic in water
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures) (2012)

1.7	Major field crops cultivated	Area (ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	76545	32847	109392					109392	
Wheat	-	-		70140	11392	81532		81532	
Barley	-	-		856	507	1363		1363	
Maize	2562	1638	4200	48.36	29.64	78		4278	
Mustard/Tori	-			1920	1080	3000		3000	
Arhar	360	105	465					465	
Gram	-			2624	1476	4100		4100	
Lentil	-			3456	1944	5400		5400	

	Horticulture crops – Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	3378		
	Guava	1495		
	Anola	37		
	Papaya	26		
	Lemon	319		

	Banana	223		
	Horticulture crops – Vegetables	Total	Irrigated	Rainfed
	Tomato	745		
	Potato	3000		
	Chili	469		
	Brinjal	689		
	Cauliflower	704		
	Cabbage	512		
	Onion	928		
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	Mentha	425		
	Saved musli			
	Plantation crops	-	-	-
	Fodder crops	-	-	-
	Total fodder crop area	-	-	-
	Grazing land	-	-	-
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	Livestock		Male ('000)	Female ('000)	Total ('000)	
	Non descriptive Cattle (local low yielding)				119697	
	Improved cattle				29.245	
	Crossbred cattle				57954	
	Non descriptive Buffaloes (local low yielding)				189293	
	Descript Buffaloes				8.544	
	Goat				71033	
	Sheep				22487	
	Others (Camel, Pig, Yak etc.)				8.465	
	Commercial dairy farms (Number)					
1.9	Poultry		No. of farms	Total No. of birds ('000)		
	Commercial				112.963	
	Backyard				37.950	
1.10	Fisheries (Data source: Chief Planning Officer)					
	A. Capture					
	i) Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets	Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds	No. of Reservoirs		No. of village tanks	
			642			
	B. Culture					
			Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)	

	i) Brackish water (Data Source: MPEDA/ Fisheries Department)			
	ii) Fresh water (Data Source: Fisheries Department)			
	Others			

1.11 Production and Productivity of major crops (Average of last 5 years: 2007, 08, 09, 010, 11; specify years)

1.1 1	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 MT)	Productivity (q/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Rice	96	14.86-29.72	-		-	-	-	-	-
	Wheat	172	20.55-30.52	-		-	-	-	-	-
	Maize	11	26.71-35.25	-		-	-	-	-	-
	Mustard / Tori	3		-	10.32-12.00	-	-	-	-	-
	Gram	2		-	7.22-10.13	-	-	-	-	-
	Lentil			-	7.0-9.0	-	-	-	-	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango		-	-	-	-	-	-	-	-
	Guava		-	-	-	-	-	-	-	-
	Potato	27	-	-	-	-	-	-	-	-
	Onion		-	-	-	-	-	-	-	-
	Tomato		-	-	-	-	-	-	-	-
	Papaya		-	-	-	-	-	-	-	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Pearl millet	Rice	Chickpea/lentil	Wheat	Pigeon Pea
	Kharif- Rainfed	1 st week of August-2 nd week of August	-	-	-	1 st week of July-2 nd week of July
	Kharif-Irrigated	-	4 th week of May-1 st week of June	-	-	-
	Rabi- Rainfed	-	-	2 nd week of October-4 th week of October	2 nd week of October-4 th week of October	-
	Rabi-Irrigated	-	-	-	3 rd week of October-2 nd week of November	-

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought		√	
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave		√	
	Cold wave		√	
	Frost		√	
	Sea water intrusion			
	Pests and disease outbreak (specify)			
	Others (specify)			

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

Annexure I

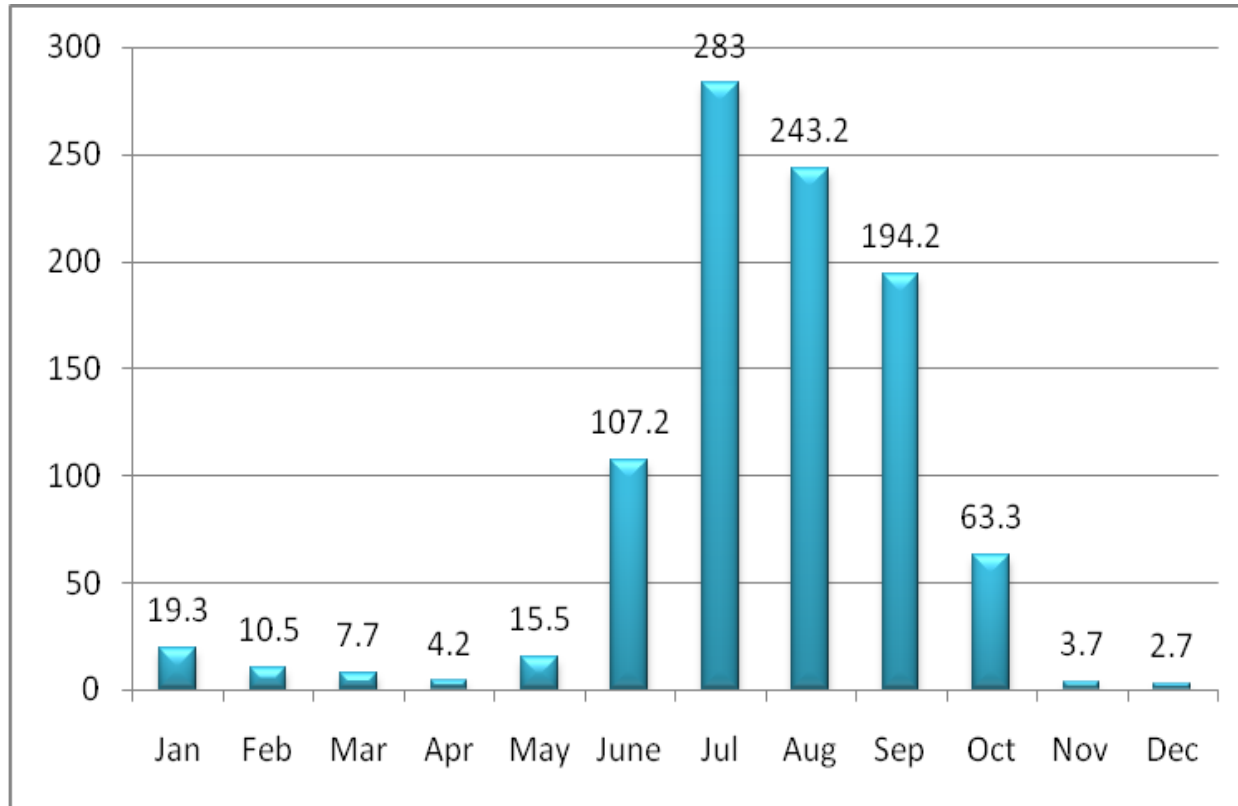
Agro climatic Zones of Bihar



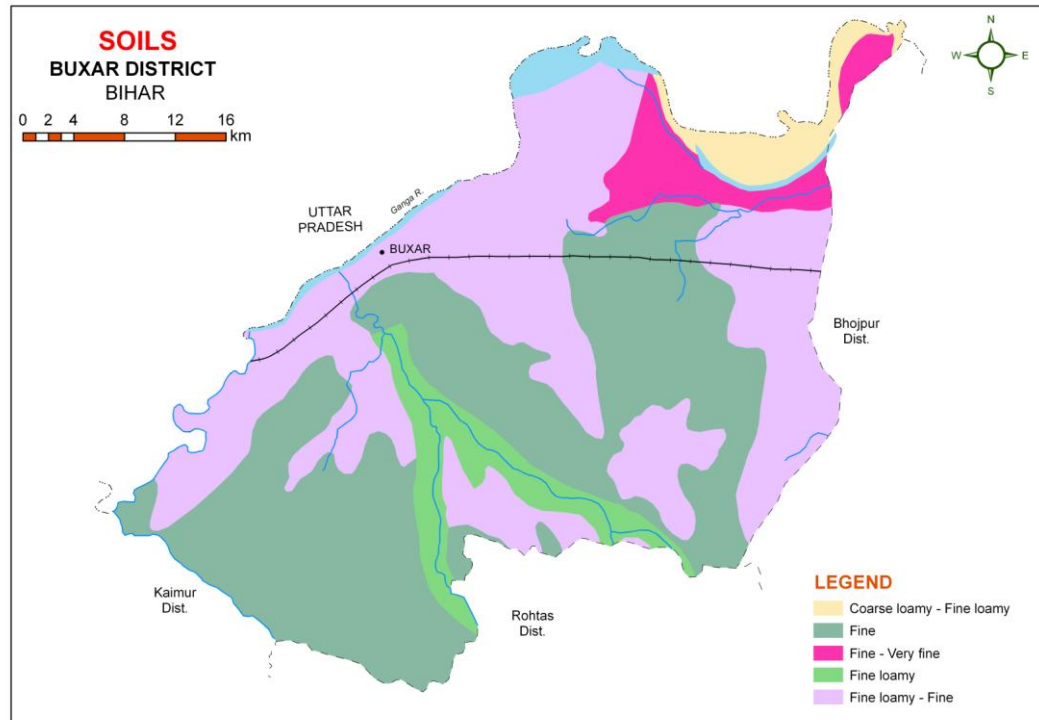
Source: krishi.bih.nic.in

Annexure-II

Mean annual rainfall (mm)



Annexure-III



Source: NBSS& LUP, Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures ^d	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 4 th week of June	Low & Medium low land	Rice-wheat	Short duration (110-130 d) varieties: : Richariya, Dhanlaxmi, Saroj, IR36 NDR 359, Naveen, Rajendra Sweta, Induri Sambha	System of Rice Intensification (SRI) Life saving irrigation	
	Medium land	Rice-Lentil	Naveen, Jaldi Dhan 13, NDR 97, Prabhat, Turanta, Kanchan	-	
	Medium upland	Rice-chickpea	Naveen, Jaldi Dhan 13, NDR 97, Prabhat, Turanta, Kanchan	-	
	Medium land	Maize-potato-onion	Hybrid: Saktiman 1, Saktiman 2, Pusa Early, Ganga 2, Ganga 11, Sartaj 102 Composit: Kachan Azad 160, Daccan 107	-	
		Rice-wheat-green gram	IR36 NDR 359, Saket 4	-	

Condition	Major Farming situation	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Early season drought (delayed onset) Delay by 4 weeks 2 nd week of July	Low & Medium low land	Rice-wheat	Short duration (105-110 d) : Pusa 2-21, Pusa 33, IET 834, Saket 4, Narendra Dhan 80, Naveen	1.SRI to be adopted 2.Life saving irrigation to be provided at critical stages such tillering	
	Medium land	Rice-Lentil	Naveen, Sahbhagi, NDR 359, Susk Samrat, Jaldi Dhan 13		

	Medium upland	Rice-chickpea	Naveen, Sahbhagi, NDR 359, Toranta, Jaldi Dhan 13, Susk Samrat		
	Medium land	Maize-potato-onion	Short duration maize such Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Sartaj 102, Composit - Kanchan, Azad Deccan 107, Navneet etc. can be sown.		
		Rice-wheat-green gram			

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
Early season drought (delayed onset)			Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 6 weeks 4th week of July	Low & Medium low land	Rice-wheat	Short duration (70-75 d) : Turanta, Prabhat (90-95 d), Richariya (95-100 d), Dhan lakshmi (95-100 d), Jaldi Dhan 13, Susk Samrat.	1.Direct seeded Rice. 2. If seedling available then transplant 3-4 seedling per hill with close spacing 3.Life saving irrigation	
	Medium land	Rice-Lentil	Turanta, Prbhat, Jaldi Dhan 13.		
		Rice-chickpea	Jaldi Dhan 13, Turanta.		
	Medium upland	Maize-potato-onion	Short duration maize such Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit - Kanchan, Azad, Navneet etc. can be sown.		
	Medium land	Bajra-Wheat	Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit - Raj 171, ICMV 155, WCC 75.	2-3 ploughing is sufficient. Water logging to be avoided	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 weeks 2 nd week of August	Low & Medium low land	Rice-wheat	Short duration (70-75 d) : Turanta, Prbhat, Jaldi Dhan 13, NDR 97,	1.Direct seeded Rice. 2. If seedling available then transplant 3-4 seedling per hill with close spacing 3.Life saving irrigation	
	Medium land	Rice-Lentil	Turanta		
		Rice-chickpea	Turanta		
	Medium upland	Maize-potato-onion	Short duration maize such Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit - Kanchan, Azad, Navneet etc. can be sown.		
		Others	Pigeon pea varieties: Sharad, Pusa 9	2-3 ploughing is sufficient. Water logging to be avoided	
		Others	Blackgram : Naveen, Narendra Urd 1 Pant Urd 31		
	Medium upland	Others	Kulthi: BR5, BR 10		
		Others	Potato: Kufri Asoka, Kufri Chandramukhi, Kufri Pukhraj, Kufri Pushkar	Ridge and furrow method of planting	
		Others	Vegetables: radish(Pusa Chetaki, Kashi Sweta), Amarenthus Spp., Spinach, cabbage	Rose bed nursery rising.	
		Others	Green manuring : Dhaincha		
		Medium land	Bajra-Wheat	Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit - Raj 171, ICMV 155, WCC 75.	

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Low & medium low land	Rice-wheat/ Rice-Lentil/ Rice-chickpea	If paddy crop damaged then short duration varieties to be used such as Turanta, Pusa sugandha 4 and 5, Rajendra subhasini Rajendra Bhagwati, Jaldi Dhan 13, NDR 97.	SRI method and Khurhan method to be adopted, Dapog method nursery to be transplanted at 15 days old DSR with ZT and drum seeding Proper puddling	

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	Low & medium low land	Rice-wheat/ Rice-Lentil/ Rice-chickpea	Top dressing with urea after rains Direct sowing of short duration varieties such as Turanta, Shahbhagi, Naveen SRI with short duration varieties Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%	LCC based fertilizer application Foliar application of micronutrients and Urea (1.5 %) Conoweeder in SRI Manual weeding in conventional method	

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
		Rice-wheat/	If the whole Paddy crop has been		

At flowering/ fruiting stage	Low & medium low land	Rice-Lentil/ Rice-chickpea	damaged then alternate cropping to be made with Oilseeds: Tori- Bhawani, PT 303 Pulses: Pea- Arkel, Azad P 3, Lentil- DPL 15, DPL 62,K 75, Arum,Narendra Masoor 1, HUL 57 Chickpea- KWR 108, Pusa 256, Awrodhi Early Potato –varieties- Kufari Asoka, Kufri Chandramukhi, Rajendra Aloo 3		
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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 & medium low land	Rice-wheat	Direct sowing of short duration varieties such as Turanta, Shahbhagi, Naveen SRI with short duration varieties Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%	Timely sown variety Rainfed -C 306, K 8027, RW,3016, HD 2888 Irrigated- PBW 343, K307, HUW 234, HD 2967, HP 1761, HD 2733	
		Rice-Lentil	Direct sowing of short duration varieties such as Turanta, Shahbhagi, Naveen SRI with short duration varieties Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%	K 75, DPL 15, DPL 62, Narendra Masoor 1	
		Rice-chickpea	Direct sowing of short duration varieties such as Turanta,	Rajendra Chana, BR 78, Pusa 372	

			Shahbhagi, Naveen SRI with short duration varieties Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%		
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2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Command canal provides irrigation	Rice-wheat	Direct sowing of short duration varieties such as Turanta, Shahbhagi, Naveen SRI with short duration varieties-Jaldi Dhan 13, Prbhat Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%	LCC based fertilizer application Foliar application of micronutrients Conoweeder in SRI Manual weeding in conventional method	
		Rice-Lentil	SRI with short duration varieties-Jaldi Dhan 13, Prbhat Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred. In direct sowing increase seed rate by 30%	LCC based fertilizer application Foliar application of micronutrients Cono weeder in SRI Manual weeding in conventional method	
		Rice-chickpea	SRI with short duration varieties-Jaldi Dhan 13, Prbhat Fresh Transplanting to be made from nursery if damage to Paddy crop has occurred.	LCC based fertilizer application Foliar application of micronutrients Conoweeder in SRI Manual weeding in conventional method	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Low & medium low land	Rice-wheat	SRI of Rajendra Sweta, BPT 5204	LCC based fertilizer application	
		Rice-Lentil	SRI of Turanta, Prbhat,		
		Rice-chickpea	SRI of Jaldi Dhan 13		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Low & medium low land	Rice-wheat	Maize/bajra/sorghum/cowpea-wheat/lentil	Direct seeding in ridge and furrow Mulching with farm straw	
		Rice-Lentil	Bajra, Maize		
		Rice-chickpea	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown.		

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under	Low & medium low land	Rice-wheat	Maize/bajra/sorghum/cowpea-lentil/Toria/chickpea	Direct seeding ZT in wheat, pulses and	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
delayed onset of monsoon in catchment				oilseeds. Foliar application of urea when it rains.	
		Rice-Lentil	Maize/bajra/sorghum/cowpea-lentil/Toria/chickpea	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains.	
		Rice-chickpea	Maize/bajra/sorghum/cowpea-lentil/Toria/chickpea	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains.	

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	Low & medium land	Rice-wheat	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/mustard/chickpea can be sown.	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	
		Rice-Lentil	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/mustard/chickpea can be sown.		
		Rice-chickpea	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/mustard/chickpea can be sown.	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	

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	Low & medium land	Rice-wheat	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/mustard/chickpea can be sown.	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	
		Rice-Lentil	Bajra- Hybrid –ICMH 451, Pusa	Direct seeding	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75., Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/mustard/chickpea can be sown.	ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	
		Rice-chickpea	Bajra- Hybrid –ICMH 451, Pusa 23, Pusa 322, Banjara Gold. Composit- Raj 171, ICMV 155, WCC 75. Maize- Hybrid -Pusa Early ,Sakatiman 1 , Sakatiman 2, Ganga 2, Composit- Kanchan, Azad, Navneet etc. can be sown. /sorghum/cowpea-lentil/Toria/chickpea can be sown.	Direct seeding ZT in wheat, pulses and oilseeds. Foliar application of urea when it rains	

2.2 Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Paddy	Leveling of land with laser leveler, drainage of excess water in heavy logging.	Drainage of excess water in a short span	Drainage of excess water in short span	Storage after proper drying in sun. Use of Storage bins. Aluminum phosphide for storage

Wheat	Timely drainage of excess water,	Drainage of excess water in short span	Drainage of excess water in short span	Use of storage bins. Cellphos (Aluminum Phosphide) for storage
Lentil	Quick timely drainage to be made	Quick timely drainage	Quick timely drainage	Use of storage bins
Mustard	Quick timely drainage to be made	Quick timely drainage to be made	Quick timely drainage to be made	Oil extraction
Heavy rainfall with high speed winds in a short span²				
Outbreak of pests and diseases due to unseasonal rains				

2.3 Floods

Condition	Suggested contingency measure ^o			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Continuous submergence for more than 2 days ²	Not applicable			
Sea water intrusion ³				

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone

Extreme event type	Suggested contingency measurer			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Paddy , Maize, Pigeonpea	Life saving irrigation	Life saving irrigation	Life saving irrigation	-
Wheat	-	-	Life saving irrigation (Terminal heat)	-
Horticulture				
Mango, Papaya	Life saving irrigation	Life saving irrigation	Life saving irrigation	

Cold wave				
Wheat, Maize, Mustard , Potato , Pulses		Irrigation, interculture and use as mulch with uprooted weeds		
Horticulture				
Bhindi, Brinjal , Chili, Tomato, Lauki		Irrigation, interculture and use as mulch with uprooted weeds		
Frost				
Wheat , Gram , Redgram, Lentil		Irrigation, interculture and use as mulch with uprooted weeds		
Horticulture				
Bhindi	Treat the seeds in 0.2% soln of Dithane M-45	Irrigation, interculture and use as mulch with uprooted weeds		
Brinjal				
Chilli				
Tomato & Potato	Treat the seeds in 0.2% soln of Dithane M-45	Earth up to 15cm ht. Irrigation interculturing, mulching by weeds	Spray Dithane M-45/ Mancozeb @ 2.5 gm/ltr of water in 3 rd week of December at 10 days interval 3 times	Harvest in dry weather
Hailstorm	Not applicable			
Cyclone	Not applicable			
Cyclone				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought			
Feed and fodder availability	<p>Silage and hay preparation, Condensed feed blocks, Planting of Perennial fodders such as hybrid napier, Fodder trees such as subabool in rainfed areas. Cultivation of seasonal fodders such as maize, oats, berseem, cowpea. Harvesting of green fodder for hay/ silage preparation at proper plant stage, moisture content , proper curing.</p>	<p>Molasses-urea- Jaggery mix for feeding, Concentrates based balanced feeding. Hay and silage if available. Fodder tree leaves such as subabool, babool, bamboo etc.</p>	Balanced feeding,
Drinking water	<p>Recharging of ground water, well network of ponds interconnected with each other, from higher topography to lower. Rainwater harvesting. Construction of new and renovation of old farm ponds.</p>	<p>Ad lib drinking water to be provided to the livestock. Harvested rainwater can be used for drinking purpose after proper physical/ chemical treatment. Quality drinking water free from microbiological contamination of E. Coli, Shigella etc, excess of TDS, Salts, excess of Fluorides, Chlorides, Arsenic, Lead etc., to be avoided at all cost. Harvested rainwater is soft water</p>	

		and can be used for washing of utensils, cleaning of farm etc. Pond water can be used for drinking Use of drinking water from well and farm tank.	
Health and disease management	Vaccination of livestock as per vaccination schedule be made	Nutritional imbalances due to improper feeding can be overcome with nutritional supplements.	Vaccination to be continued, Supplements to be continued till full recovery.
Floods			
Feed and fodder availability			
Drinking water			
Health and disease management			
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management	Construction of structures such as proper housing for providing ambient Micro environment be made. Environment controlled housing though best is not economically feasible in our state.	During cold wave heating be provided and in hot wave ad lib cold drinking water be provided. Use of foggers, sprinklers and feed supplements to overcome heat stress.	
Health and disease management		Proper feeding during cold wave. During heat wave heat stress can reduce production and reproduction	

^s based on forewarning wherever available

2.5.2

Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought				
Shortage of feed ingredients	Storage godowns for storage of feed.	Feeding from store. Use of non-conventional and agro-residues to reduce feed cost	Replenish the store	
Drinking water	Rainwater harvesting, recycling of water.	Use for drinking or other needs after proper treatment, judicious use, recycling continued	Recycling to be continued	
Health and disease management	Proper medicines (herbal/allopathic) for minimizing heat stress.	Use of Organic acids, weak bases, ad lib drinking water, herbal medicines (Zeetress), feed supplements to minimize mortality due to heat stress.	Store medicines / supplements be replenished	
Floods				
Shortage of feed ingredients				

Drinking water				
Health and disease management				
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management	Proper construction materials (R factor) to be used for construction of houses which can protect from extremes of heat and cold. Low cost suitable materials, locally available can be used.	During cold wave minimize ammonia accumulation and wet litter at all cost by providing adequate ventilation using conventional or forced ventilation. During heat wave, ad lib cold drinking water be provided. Use of foggers, sprinklers		
Health and disease management	Vaccination as per scheduled	Vaccination as per schedule	Vaccination as per schedule	

^a based on forewarning wherever available

2.5.3

Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
2) Floods			
A. Capture			
Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No. of houses damaged			
(iii) Loss of stock			

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

(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			

^a based on forewarning wherever available