State: BIHAR

Agriculture Contingency Plan for District: LAKHISARAI

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern Plain, Hot Subhumid (moist) Eco-Region (13.1)		
	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)	Aurangabad, Gaya, Jahanabad, Patna, Arwal, Rohtash, Nalanda, Bhojpur, Buxar, Bhabhua, Nawada, Munger (Before coming into existence as a new district, Lakhisarai was a sub-division within Munger District)		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		25^0 10' N	86^0 4' E	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agricultural Research Institute, Patna		
	Mention the KVK located in the district with address	KVK, Lakhisarai		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Agricultural Research Institute, Lohia Nagar, Patna.		

1.2	**Rainfall**	**Normal RF(mm)**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep)	863.1	3rd week of June	3rd week of October
	NE Monsoon(Oct-Dec)	139		
	Winter (Jan-Feb)	11.8		
	Summer (March -May)	81.0		
	Annual	1094.9		

1.3	**Land use pattern of the district**	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area (‘000 ha)	128.1	77.2	10.6	15.6	0.02	0.2	0.3	4.9	19.1	.011

1. 4	**Major Soils**	**Area (‘000 ha)**	**Percent (%) of total**
	Sandy Soils	3.152	3.00
	Coarse Sandy Loam Soils	15.174	14.46
	Fine Sandy Loam Soils	42.942	40.91
	Clayey Soils	43.685	41.62
	Saline/ Calcareous Soils	0.0	0.00

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	77.2	166%
	Area sown more than once	50.9	
	Gross cropped area	128.1	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	42.1		
	Gross irrigated area	62.1		
	Rainfed area	35.1		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		10.9	18%
	Tanks		9.0	15%
	Open wells		6.1	10%
	Bore wells	1380	22.1	36%

	Lift irrigation schemes		1.7	3%
	Micro-irrigation			
	Other sources (please specify)			
	Total Irrigated Area		62.094	80%
	Pump sets	55	12.214	18%
	No. of Tractors	583		
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe	6	100%	Fluoride (0.6 – 7.07 ppm)
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice	27.3		27.3					27.3
	Wheat				18.2				18.2
	Maize		2.1	2.1	6.0				8.1
	Chickpea					4.8			4.8
	Lentil					11.3			11.3

	Horticulture crops - Fruits	**Area (‘000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	0.81		0.81
	Guava	0.11		0.11
	Banana	0.08		0.08
	Others	0.85		0.85
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Pea	0.5		0.5
	Potato	0.48		0.48
	Tomato	0.43		0.43
	Cabbage & Cauliflower	0.23		0.23
	Brinjal	0.125		0.125
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	Plantation crops			
	Fodder crops			
	Total fodder crop area			
	Grazing land			
	Sericulture etc			

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	29	41	70
	Improved cattle			
	Crossbred cattle	1.3	12.2	13.5
	Non descriptive Buffaloes (local low yielding)	3	34	37
	Descript Buffaloes			
	Goat			89.7
	Sheep			0.1

	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial		303.9	
	Backyard			

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		35		118		83	
	B. Culture						
				Water Spread Area (ha)	**Yield (t/a)**	**Production ('000 tons)**	
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)						
	ii) **Fresh water** (Data Source: Fisheries Department)			330	3.2	0.690	

1.11 Production and Productivity of major crops (Average of last 5 years: 2004- 08)

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	

Major Field crops (Crops identified based on total acreage)										
	Rice	58.1	2014					58.1	2014	
	Maize	5.5	1810	17.1	2167			22.6	3977	
	Wheat			39.3	2205			39.3	2205	
	Chickpea			0.8	224			0.8	224	
	Oil seeds			0.2	147			0.2	147	

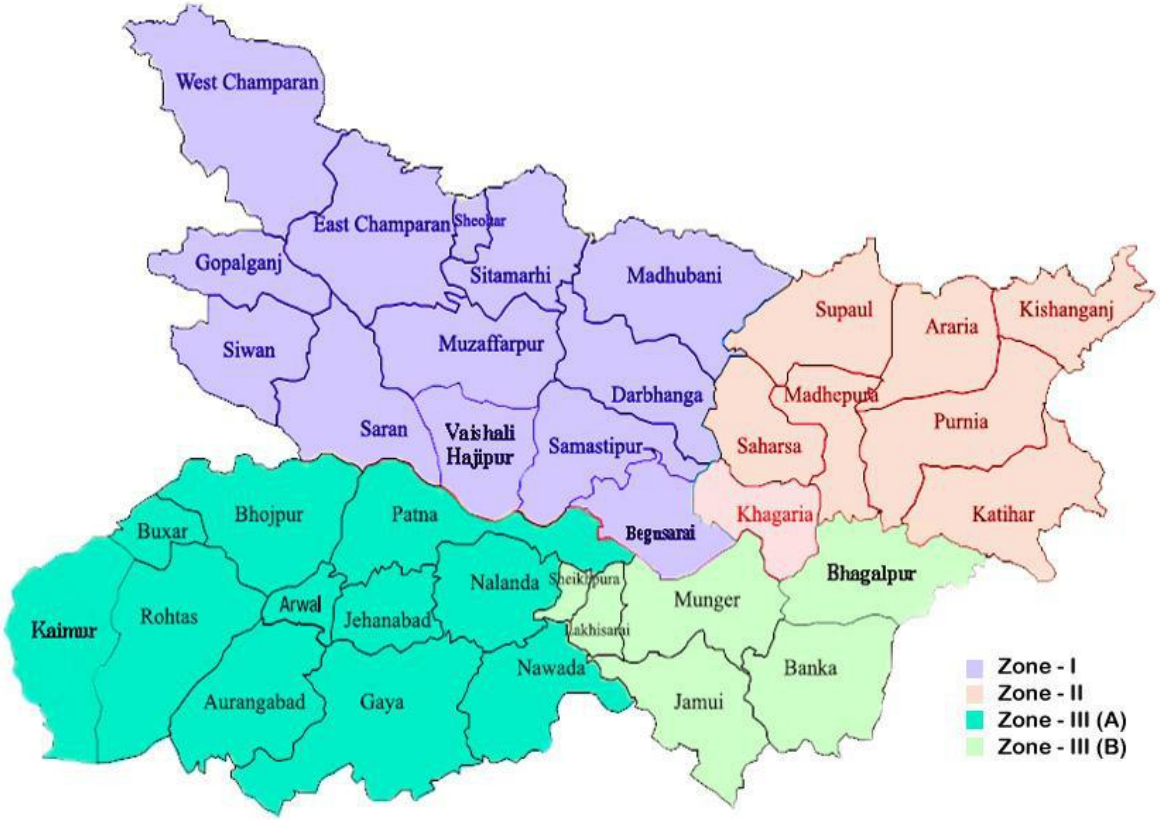
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Wheat**	**Maize**	**Chickpea /Lentil**	**Mustard**
	Kharif- Rainfed	2nd week of June - 3rd week of June	-	3rd week of May - 2nd week of June	-	-
	Kharif-Irrigated	3rd week of June – 2nd week of July	-	4th week of June – 1st week of July	-	-
	Rabi- Rainfed	-	1st week of November – 2nd week of November	1st week of October – 1st week of November	2nd week of October – 2nd week of November	1st week of October – 4th week of November
	Rabi-Irrigated	-	2nd week of November – 2nd week of December	3rd week of October – 2nd week of November	3rd week of Oct. – 3rd week of Nov.	1st week of November – 4th week of December

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	√		

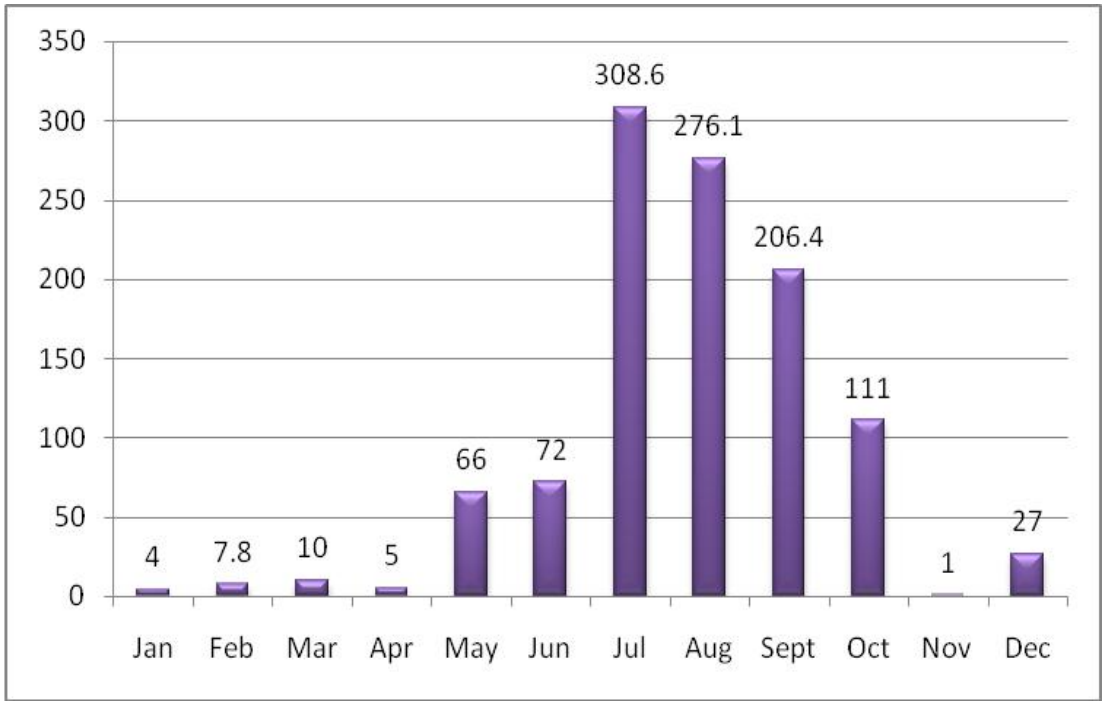
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

Annexure I
Agro climatic Zones of Bihar

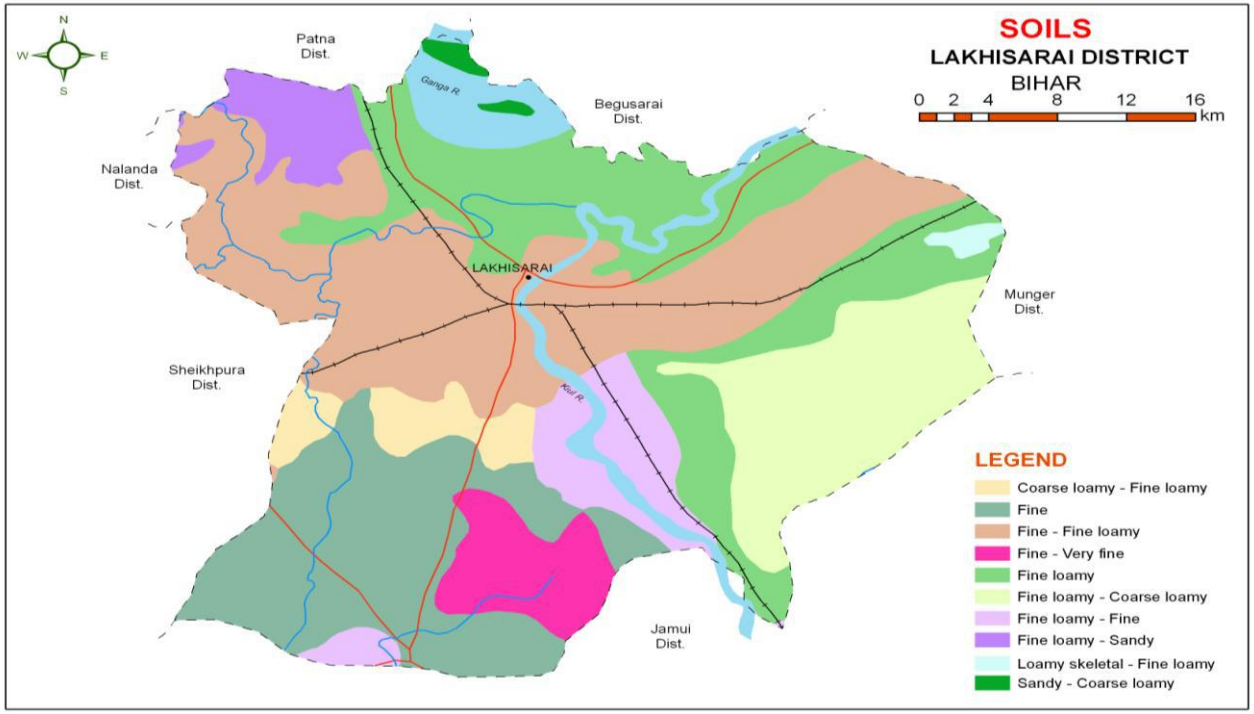


Source: krishi.bih.nic.in

Annexure II
Mean annual rainfall (mm)



Annexure III



Source: NBSS&LUP, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks 1st week of July	Up land Sandy loam to clay loam soil	Maize- Lentil/Lathyrus Pigeonpea- Fallow	Pigeonpea Maize: Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3	• Normal package of Practices	
	Mid land	Rice- Wheat Rice- Maize	Rice –Wheat Rice-Maize Rice – Pusa 2-21, Rajendra Suwasni, Prabhat , Sita	• Adopt normal package of practices . • Groundwater to be used for life saving irrigation to upland crops and transplanted rice	
	Low land	Rice- Wheat Rice- Maize-Greengram	Rice- Wheat Rice- Maize- Green gram Medium to long duration Rice- Rajendra Suwasni, Rajendra Sweta Rajendra Mahsuri -1		

Condition			**Suggested Contingency measures**		
Early season drought (delayed	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**

onset)					
Delay by 4 weeks 3rd 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 • Life saving irrigation • Use of mulches • Gap filling • Balanced dose of NPK	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Mid land	Rice- Wheat Rice- Maize	Rice –Wheat Rice-Maize Short duration Rice 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 • 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 • Transplant with 30-35 days old seedling may be used with 3-4 seedling per hill with close spacing.	
	Low land	Rice- Wheat Rice- Maize-Greengram	Rice- Wheat Rice- Maize- Greengram Rice- Direct/ dapog seedlings with Rajshree, Santosh , Sita, Rajendra Suwasni, Rajendra Sweta, Swarna sub-1		

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 6 weeks 1st week of August	Up land Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	Finger millet Finger millet- RAU-7&8	• Normal package of Practices • Life saving irrigation •	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Mid land	Rice- Wheat Rice- Maize	Rice- Prabhat, Dhanlaxmi, Richharia, Turanta Saroj Finger millet – Linseed Finger millet- RAU-7&8	• Direct seedling of Rice • Raise staggered community nursery preferably with medium duration varieties in mid and lowlands • Application of fertilizers especially phosphorous and potash to be ensured under late transplanted conditions in severely affected districts • Life saving irrigation	
	Low land	Rice- Wheat Rice- Maize- Greengram	Rice (Short Duration)-Wheat Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj If dry spell continues, direct seeding of short duration rice varieties (100 days) can be done in midlands by first fortnight of August and extra short duration (70-75 days) up to 25th August		

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 8 weeks 3rd week of August	Up land Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	Finger millet /Til Finger millet- RAU-7&8	• Moisture conservation • Inter cultivation • Sowing of *rabi* crops such as Wheat, Lentil, Chickpea, Pea, Mustard (Pusa Mahak, RAU TS17), Linseed (Garima) and Vegetables	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Mid land	Rice- Wheat Rice- Maize	Finger millet – Linseed Finger millet- RAU-7&8		
	Low land	Rice- Wheat Rice- Maize- Green gram	Rice short duration (Direct seeded)-Wheat Rice- Prabhat, Dhanlaxmi, Richharia, Turanta Sowing of *rabi* 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.	• Re-transplanting of rice (karuhan) can be done with 30 + 45 days old seedlings of long duration or photosensitive varieties up to 30th August with close planting (40-45 hills per square meter) • Application of organic manure and vermi compost initially for Rice and other crops. • • Fodder varieties of Jowar, Maize, Bajra in combination with legumes (cowpea	

				and horsegram) can be taken up wherever feasible to meet the fodder requirements in deficit rainfall districts	

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**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Up land Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	• Gap filling of existing crop	• Application of potash • Mulching for moisture conservation • Conservation tillage	Seeds from BRBN, BAU, Sabour, NSC, TDC
	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 vegetative stage	Up land Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	• Life saving irrigation • Gap filling of existing crop	• Foliar application of MOP @1% • Mulching for moisture conservation • Conservation tillage	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Mid land	Rice- Wheat Rice- Maize	• Gap filling of existing crop • Postponement of top dressing • Life saving irrigation	• Mulching through weeds, • Foliar application of (1%) Urea and zinc sulphate	
	Low land	Rice- Wheat Rice- Maize- Greengram		• Inter culturing • Mulching • Conservation tillage • Foliar spray with (1%) Urea or MOP • Life saving irrigation	

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 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 potash@1% • Mulching • Spraying of micronutrient	
	Mid land	Rice- Wheat Rice- Maize			

	Low land	Rice- Wheat Rice- Maize- Greengram			

Condition			**Suggested Contingency measures**		
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 Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	• Application of potash@1% foliar application • Mulching • Thinning • 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.	
	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-1,2,3,4,5, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3	• Use of mulches • Spray of micronutrient • Life saving irrigation	Seeds from BRBN, BAU, Sabour, 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 Canal irrigated	Rice- Wheat- Greengram Rice- Potato- Summer vegetables Rice- Maize- Greengram	Rice- Wheat Rice- Potato Rice- Maize Rice- Prabhat, Dhanlaxmi, Richarria, Saroj	• Direct seeding of rice • Use dapog nursery seedlings • Adopt SRI technology • Spray of 20 kg/ha of nitrogenous fertilizer over & above basal dose when moisture is available (limited water) • Moisture conservation through mulching	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		
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		
	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		Normal Crop/cropping	Suggested Contingency measures

	Major Farming situation[f]	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	Not Applicable				
Insufficient groundwater recharge due to low rainfall					

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	• Gap filling • Removal of excess water	• Drainage management • Sowing of subsequently crop, if totally damaged i.e. Toria	• Drainage management • Subsequent crop if totally damaged • Harvest at physiological maturity	Storage at safer place
Maize	• Gap filling • Removal of excess water • Resowing, if completely damaged	• Drainage management • Sowing of alternative maize or other rabi crop if totally damaged	• Drainage management • Subsequent if totally damaged • Harvest at physiological maturity	Storage at safer place
Pigeonpea	• September sowing of red gram (var. Sharad), if, previous Pigeonpea crop is	• Drainage management • Sowing of alternative rabi maize or other crops like	• Drainage management • Harvest at	Storage at safer place

	completely damaged • Gap filling, if needed • Removal of excess water	chilli \ tomato\ brinjal if totally damaged	physiological maturity	
Horticulture				
Mango	• Strengthening of Drainage system • Replanting of crop if substantially damaged	• Strengthening of Drainage system • Drenching with copper fungicides	• Strengthening of Drainage system • Harvesting at proper time	Immediate sale of fruits and safe transportation
Heavy rainfall with high speed winds in a short span[2]				
Rice	• Gap filling • Removal of excess water	• Strengthening of Drainage system • Sowing of subsequent crop, if totally damaged i.e. Toria	• Strengthening of Drainage system • Subsequent crop if totally damaged • Harvest at physiological maturity	Storage at safer place
Maize	• Gap filling • Removal of excess water • Resowing, if completely damaged	• Strengthening of Drainage system • Sowing of alternative maize or other rabi crop if totally damaged	• Strengthening of Drainage system • Subsequent if totally damaged • Harvest at physiological maturity	Storage at safer place
Pigeonpea	• September sowing of Pigeonpea (var. Sharad), if, previous Pigeonpea crop is completely damaged • Gap filling, if needed • Removal of excess water	• Strengthening of Drainage system • Sowing of alternative rabi maize or other crops like chilli \ tomato\ brinjal if totally damaged	• Strengthening of Drainage system • Subsequent if totally damaged • Harvest at physiological maturity	Storage at safer place
Outbreak of pests and diseases due to un-seasonal rains				
Rice	• Removal of excess water	• Strengthening of Drainage	• Strengthening of Drainage	Storage at safer place

	❖ Seedling treatment with granular insecticide – Cartap hydrochloride or phorate 10G or carbofuran 3G. ❖ Maintain shallow water in nursery beds ❖ Providing good drainage.	system • Implementation of IPM practices • Use copper fungicides against Bacterial leaf blight. • Split application of N fertilizer (3-4 times)	system • Implementation of IPM practices	
Maize	• Soil application of granular insecticides viz. Phorate 10 g/Carbofuran 3g in whorl of maize • Implementation of IPM practices	• Strengthening of Drainage system • Implementation of IPM practices • Foliar blight control through Mancozeb @ 2.5g/l Or Zineb/ Maneb @ 2.5-4 g/lit of water (2-4 applications at 8-10 days interval)	• Cob harvesting from standing crop • Harvest at physiological maturity	Storage at safer place
Pigeonpea	• Provide drainage • Seed treatment with 1 g carbendizim +2g thiram/kg seed.	• Strengthening of Drainage system • Implementation of IPM practices	• Strengthening of Drainage system	Storage at safer place
Horticulture				
Mango	**Anthracnose:-** The foliar infection can be controlled by spraying of copper oxychloride (0.3%) Use bio control agent viz	**Anthracnose:-** Apply Carbendazim/ Thiophanate methyl (1g/lit) to control of Anthracnose. Blossom infection can be controlled effectively by	**Mango powdery mildew:** Prune diseased leaves and malformed panicles harbouring the pathogen to reduce primary inoculum load.	Harvest at proper time **Anthracnose:-** Pre-harvest sprays of hexaconazole (0.01%)

	Streptosporangium pseudovulgare **Bacterial canker:** Regular inspection of orchards, sanitation and seedling certification are recommended as preventive measures. Mango stones for raising seedlings (root stock) should always be taken from healthy fruits. Use of wind-breaks helps in reducing brushing/ wounding and thus reduces the chance of infection.	spraying of Bavistin (0.1%) at 15 days interval. **Mango powdery mildew:** Spray wettable sulphur(0.2%) & calixin or karathane (0.1%) during second week of December	Spray wettable sulphur (0.2%) when panicles are 3-4" in size Spray dinocap (0.1%) 15-20 days after first spray. Spray tridemorph (0.1%) 15-20 days after second spray. Spraying at full bloom needs to be avoided. **Mango bacterial canker:** Three sprays of Streptocycline (200 ppm) at 10 days intervals reduce fruit infection. In severe infection, spraying of Streptocycline (300 ppm) or copper oxychloride (0.3%) is more effective.	or Carbendazim (0.1%) at 15 days interval should be done in such a way that the last spray falls 15 days prior to harvest. Diseased leaves, twigs, and fruits, should be collected and burnt to avoid the spread for next season

2.3 Floods

Condition	**Suggested contingency measure[o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
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 measure[r]			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Maize	• Life saving irrigation	• Life saving irrigation	• Life saving irrigation	
Pigeonpea	• Life saving irrigation	• Life saving irrigation	• Life saving irrigation	
Wheat	• Life saving irrigation	• Life saving irrigation	• Life saving irrigation	
Horticulture				
Mango	• Life saving irrigation	• Life saving irrigation	• Life saving irrigation	
Cold wave[q]				
Wheat, Maize, Mustard, Potato, Pulses		• Light irrigation • Mulching by crop residue \ weed		
Horticulture				
Brinjal, Chilli, Tomato, Bhendi		• Light irrigation • Mulching by crop residue \ weed		
Frost				
Wheat, Maize, Mustard, Potato, Pulses		• Light irrigation • Mulching by crop residue \ weed		
Horticulture				
Brinjal, Chilli, Tomato, Bhendi		• Light irrigation • Mulching by crop residue \ weed		
Hailstorm	Not Applicable			
Cyclone	Not Applicable			

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	1. Cultivation of fodder tree Storage of Improved Quality Fodder 2. Conservation & Storage of • Feed & Fodder • Hay & Silage: — Preserve the fodder in the form of hay from Berseem & other grasses as well as silage from (a) Maize- harvesting at well developed cob. (b) Hybrid Napier – 40-45 day old. (c) Potato leaves mixing with wheat straw in ratio of 7:1 and should be supplemented with 3% molasses. 3. Development of Fodder Bank	1. Feeding of stored Hay/Silage/Improved Quality Fodder 2. Feeding of Tree leaves some of which are as follows: 1. Bamboo leaves 2. Bargad 3. Peepal 4. Seesam 5. Subabul 6. Gooler	Production of forage crops 1. Balanced feeding of Animal supported with little higher concentrate mixture 2. Cultivation of fodder- Berseem, cow pea, maize, oat,
Drinking water			
Health and disease management	Veterinary Preparedness with Medicines, Vaccines and provision for mobile ambulatory van. • Vaccination Necessary vaccination of livestock	Animal safety • Prevention from heat • Frequent drinking water availability to the animal • Fresh and green fodder availability	• Sanitation, • De worming, • Treatment, • Health camps • Culling of Sick animals and

	and poultry should be done against economically important contagious disease. This will be helpful not only to check epidemic in animals, but also to reduce the probability of zoonoses in human beings. Care should be taken for mass vaccination of livestock and poultry with a view to covering 80% of livestock population in order to achieve herd immunity. Mass vaccination should be conducted by a team of Department staff with proper maintenance of detailed Inoculation Register. Pro-active steps should be taken to receive and stock the required doses of vaccines against different diseases.	• Proper deworming at definite interval • Proper vaccination at definite interval • Disinfection of livestock premises and Poultry shed regularly	• Disposal of carcass

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				
Health and disease management	Vaccines to be used for Poultry Mareks disease vaccine RDV (F_1 & R_2B), FPV,			

	IBRV & IBDV			
Cyclone	Not Applicable			
Heat wave and cold wave				

[a] based on forewarning wherever available

2.5.2 Fisheries/ Aquaculture

	Suggested contingency measures			**Convergence/ linkages with ongoing programs, if any**
	Before the event[a]	**During the event**	**After the event**	
Drought	Not Applicable			
Floods				
Cyclone/ Tsunami				
Heat wave& Cold Wave				

[a] based on forewarning wherever available