

State: Bihar

Agriculture Contingency Plan for District: Patna

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)	Patna, Gaya, Aurangabad, Jahanabad, Rohtas, Arwal, Nalanda, Bhojpur, Buxar, Bhabhua, and Nawada		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		25 ⁰ 60 N	85 ⁰ 11 E	54.0 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Station. (Agricultural Research Institute, Patna)		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra Agwanpur, Barh, Patna - 803 213		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Agricultural Research Institute, Lohiya Nagar, Patna.			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep)	906	41	3 rd week of June	3 rd week of October
	NE Monsoon(Oct-Dec)	71	3		
	Winter (Jan-Feb)	28	3		
	Summer (Mar -May)	49	3		

	Annual	1054	50		
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Source: District Agriculture office, Patna

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)	317.2	228.5	-	15.1	9.1	11.1	12.6	13.1	2.0	25.5

Source: District Agriculture Office, Patna

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	Clay to clay loam soils	67.1	31.3
	Sandy loam soils	70.5	32.9
	Medium to heavy soils	76.2	35.6

Source: District Agriculture Office, Patna

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	228.5	160.3%
	Area sown more than once	137.8	
	Gross cropped area	366.4	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	179.5		
	Gross irrigated area	179.5		
	Rainfed area	48.9		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	1	51.1	28.4
	Tanks			

Open wells			69.7
Bore wells		125.3	
Lift irrigation schemes			
Micro-irrigation			1.7
Other sources		3.1	
Total Irrigated Area		179.5	
Pump sets			
Electric	71682	27.5	
Diesel	92851		
No. of Tractors	2000	175.8	
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	23	100%	
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)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	105	30	135	-	-	-	-	135	
Maize	7	1.3	8.03	-	-	-	-	8.03	
Pigeonpea	-	2.9	2.9	-	-	-	-	2.9	
Wheat	-	-	-	95	0.17	95.1	-	95.1	
Lentil	-	-	-	-	46.1	46.1	-	46.1	
Chickpea	-	-	-	-	28	28	-	28	
Potato	-	-	-	10.1		10.1	-	10.1	
Mustard	-	-	-	7.1		7.1	-	7.1	
Pea	-	-	-	2.6		2.6	-	2.6	
Greengram		-	-				0.5	0.5	

	Horticulture crops – Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	3.8		
	Lemon	0.5		
	Guava	1.07		
	Papaya	0.05		
	Banana	0.58		
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Potato	15.8		
	Brinjal	1.8		
	Orka	2.9		
	Cauliflower	3.6		
	Tomato	1.8		
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	Lemon Grass	.01	.01	
	Fenugreek	.02	.02	
	Tulsi	.02	.02	
	Suragundha	.005	.005	
	Ashwagundha & Aloe vera	.005	.005	
	Plantation crops	Total	Irrigated	Rainfed
	Mango	0.1	0.1	0.1
	Litchi	0.03	0.03	0.02
	Guava	0.01	0.01	0.005
	Fodder crops	Total	Irrigated	Rainfed
	Berseem	0.07	0.07	
	Maize	0.05	0.05	
	Oat	0.01	0.01	
	Sorghum	0.005	0.005	
	Total fodder crop area	0.1	0.1	
	Grazing land	0.3		0.3
	Sericulture etc			

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	68.7	110.6	179.3

	Improved cattle			
	Crossbred cattle	19.4	1163.3	135.7
	Non descriptive Buffaloes (local low yielding)			
	Descript Buffaloes	23.4	242.3	265.7
	Goat	55.4	141.1	196.5
	Sheep	7.4	10.01	17.4
	Others (Camel, Pig, Yak etc.)			
	Commercial dairy farms (Number)			

1.9	Poultry	No. of farms	Total No. of birds ('000)
	Commercial		71.5
	Backyard		121.1

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	
		411		1150		739	
	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)	2176.3		3.2	469.8		

1.11 Production and Productivity of major crops

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	4.06	3171					0.4	3171	
	Maize	35.4	4410					3.5	4410	
	Pigeonpea	4.5	1530					4.5	1530	
	Wheat			26.6	2797			26.6	2797	
	Lentil			0.2	640			0.2	640	
	Chickpea			3.8	1480			3.8	1480	
	Potato			23.8	23400			23.8	23400	
	Mustard			0.5	790			0.5	790	
	Pea			0.3	1180			0.3	1180	
	Greengram					0.3	720	0.3	720	
Major Horticultural crops (Crops identified based on total acreage)										
	Mango							37.2		
	Lemon							4.2		
	Guava							8.9		
	Papaya							1.2		
	Banana							26.9		

1.12	Sowing window for 5 major field crops	Pigeonpea	Maize	Rice				
	Kharif- Rainfed	1 st week of May - 4 th week of July	-	-				
	Kharif-Irrigated	1 st week of June – 2 nd week of July	4 th week of May - 2 nd week of June	4 th week of May - 1 st week of July				
		Maize	Chickpea	Lentil	Wheat	Mustard	Potato	Pea

	Rabi- Rainfed	-	1 st week of October - 1 st week of November	1 st week of October - 1 st week of November	-	1 st week of October - 1 st week of November	-	-
	Rabi-Irrigated	1 st week of October - 1 st week of November	-	-	1 st week of November - 1 st week of December	10 th October – 20 th October	1 st week of September - 1 st week of October	1 st week of September - 1 st week of October

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

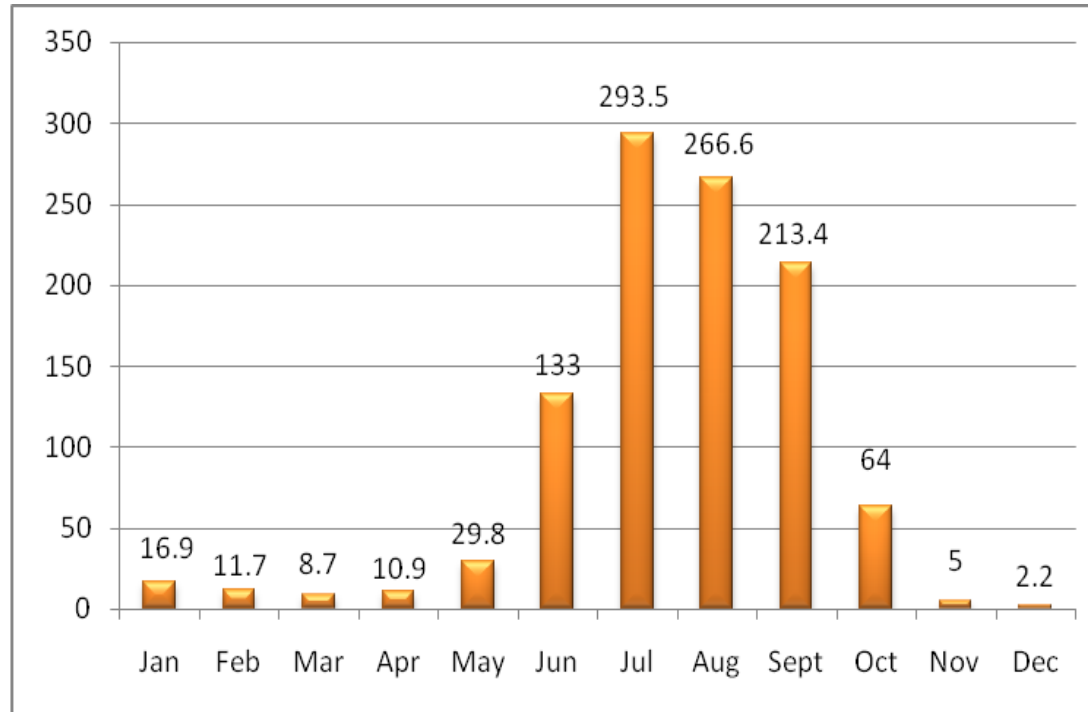
Agro climatic Zones of Bihar



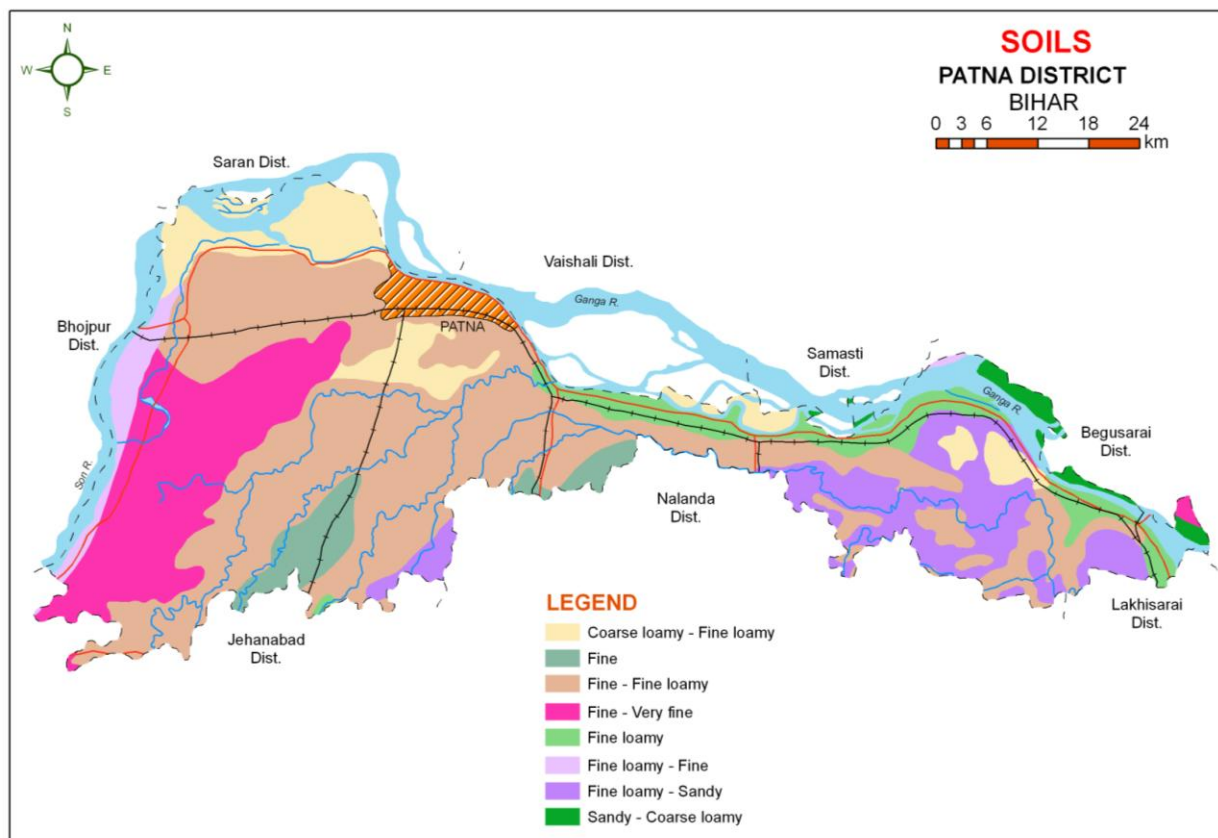
Source: krishi.bih.nic.in

Annexure II

Mean annual rainfall (mm)



Annexure-III



Source : NBSS& LUP, 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	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 1 st week of July	Upland	Rice –Wheat/ Vegetable-Vegetable/ Rice-Oilseeds/ Rice-Potato/ Rice- Chickpea/ Rice-Vegetables	No change Rice: Prefer medium to long duration varieties	<ul style="list-style-type: none"> • Normal package of practices • Direct sowing of rice can also be done 	
	Medium land	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato *In diara land – Early Maize- Wheat/Chickpea/Linseed/ Forage crop/Potato/Sweet potato/ Fallow/ Vegetable particularly Parbal and cucurbits in rainfed condition	Medium duration Rice – Wheat/ Rice –Lentil/ Rice- Linseed/ Rice- Vegetables/ Rice-Mustard/ Rice –Potato Rice : Rajendra Bhagawati, Rajendra Suwasini, Saroj, Rajendra, Kasturi, Santosh	<ul style="list-style-type: none"> • Adopt normal package of practices • Direct seeding of drought tolerant varieties in dry soil in June/ July with pre emergence herbicide application under sufficient soil moisture conditions. • Raise staggered community nursery preferably with medium duration varieties in mid and lowlands 	
	Lowland	Rice –Wheat/ Rice-Pulses/ Rice-Vegetable/ Rice-Mustard/ Rice-Potato **Tal area – Chickpea/Lentil as pure and mixed crop with wheat. In irrigated areas rabi maize or wheat can also be grown	Medium duration Rice – Wheat/ Rice –Lentil/ Rice –Linseed/ Rice –Vegetable/ Rice –Mustard/ Rice –Potato Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta Rajendra Mashuri	<ul style="list-style-type: none"> • Application of fertilizers especially phosphorous and potash to be ensured under late transplanted conditions in severely affected districts. • Interculture for timely weed control in direct seeded rice 	

			Potato : PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	<ul style="list-style-type: none"> Groundwater to be used for life saving irrigation to upland crops and transplanted rice 	
<p>* Diara land area in Bihar have developed in between natural levees that get inundated for different period of time and periodically eroded and formed due to the meandering, braiding and changing course of river. The texture of the top soil varies with the distance of the river bank, usually texture becoming heavier as the distance increased from the river bank. The top soil is usually sandy loam and salty loam and occurrence of free calcium carbonate in varying degree is also met with . Total Diara area in Bihar is 9.30 lakh ha.</p>					
<p>** Saucer shaped depressions of land surface in south of Ganges, which is under inundation during rainy season (August-October) are termed as the Tal areas. Tal land are situated beyond natural levees where there is bowl shaped depression geologically known as back waters. Tal area will remain to be efficient zone for pulses viz. Gram and lentil. Tal land of Bihar start from Chausa in Buxar district in the west and continue up to Pirpainty in the east of Bhagalpur district. These lands are mostly located in the district of Patna, Nalanda, Lakhisaria, Munger and Bhagalpur. These soils are dark coloured (gray to very dark grey), medium heavy in texture and neutral to slightly alkaline in reaction (pH between 7.0-8.0) The clay content is generally above 30% . Polygonal cracks measuring upto 5-7 cm wide and more than 100 cm deep with lime nodules within the profile are invariable observed. These soils have impeded drainage and poor air water relations. The moisture range in which physical condition of such soil is suitable for tillage and planting operation is quite narrow. Soils become dry during summer and moisture is depleted fast. If sowing is delayed, the germination is affected adversely resulting in poor yields. Tal land soils remain under water from August to early October and are mono-cropped. Soils have low permeability and poor seedbed condition due to hard clod formation on ploughing</p>					

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 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	<ul style="list-style-type: none"> 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

			Maize – Deoki . Ganga -2	<ul style="list-style-type: none"> • 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	<p>Medium duration Rice – Late Wheat Rice –Lentil/ Rice –Linseed/ Rice –Mustard/ Rice –Potato/ Rice –Vegetables</p> <p>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</p>	<ul style="list-style-type: none"> • 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 • Raise staggered community nursery preferably with short duration varieties in mid 	
	Lowland	Rice –Wheat/ Rice-Pulses/ Rice-Vegetables/ Rice-Oilseed/ Rice-Potato	<p>Medium duration Rice – Wheat/ Lentil Rice –Linseed/Vegetables/Mustard/ Potato</p> <p>Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta Rajendra Mashuri</p>		

				and lowlands <ul style="list-style-type: none"> • 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	Major Farming situation ^a	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 6 weeks 1 st week of August	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato	Short duration Rice –Wheat/ Rice –Lentil/ Rice –Linseed/ Rice –Mustard/ Rice –Potato/ Rice –Vegetables Rice- Prefer short (early matured) varieties like Birsa Dhan 105 (85-90d), Birsa Dhan-106 (90-95d), Rajendra Bhagavathi (early-upland	<ul style="list-style-type: none"> • 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, BAU, Sabour, NSC, TDC

			and midland), Dhanlaxmi, Richharia(<100d), Saroj (100-110d), Birsa Dhan-201 (100-115d), Prabhat, Turanta, Blackgram/ Finger millet-Wheat Blackgram- T-9, Navin, Pant Blackgram-30 , Pant Blackgram-19 Finger millet- DB-7, BR-5, BR-10, Coimbatore-1	
	Medium land	Rice –Wheat/ Rice-Chickpea/ Rice – Lentil	Medium duration Rice – Late Wheat Rice –Lentil/ Rice –Linseed/ Rice –Mustard/ Rice –Potato/ Rice –Vegetable Rice: Rajendra Bhagawati, Rajendra Suwasni, Saroj, Rajendra Kasturi, Santos	<ul style="list-style-type: none"> • Mat nursery (dapog method)/ Community nursery can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August • Direct seedling of Rice • Raise staggered community nursery preferably with medium duration varieties in mid and lowlands • Enhanced basal dose of NPK to boost the early vegetative growth • Application of fertilizers especially phosphorous and potash to be ensured under late transplanted conditions in severely affected districts • Life saving irrigation
	Lowland	Rice –Wheat/ Rice-Lentil/ Rice- Chickpea	Medium Rice–Wheat/ Rice –Lentil/ Rice –Chickpea Rice: Rajshree, Sakuntala, Satyam, Kishori ,Rajendra Sweta, Rajendra Mashuri Early Rice–Wheat/Pulses/ Oilseeds/Vegetables 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 25 th August		
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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) 3 rd week of August	Upland	Rice- Wheat/ Rice-Pulses/ Rice-Oilseeds/ Rice-Vegetables/ Rice-Potato	Blackgram-Rabi Maize/ Blackgram –Pigeonpea/ Blackgram- Late Wheat/ Sesame-Wheat/ Blackgram-Vegetables/ Blackgram- Lentil/ Tulsi-Lentil / Tulsi-Chickpea/ Blackgram- Potato/ Tulsi- Mustard/ Blackgram- Rai Sesame : Krishna, Pragati	<ul style="list-style-type: none"> Moisture conservation Inter cultivation Sowing of <i>rabi</i> crops such as Wheat, Lentil, Chickpea, Pea, Mustard (Pusa Mahak, RAU TS17), Linseed (Garima) and Vegetables 	Seeds from BRBN, BAU, Sabour, NSC, TDC
	Medium Land	Rice – Wheat/ Rice –Pulses/ Rice-Oilseeds/ Rice –Vegetables/ Rice -Potato	Rice(Short duration)-Wheat / Blackgram- Late Wheat/ Blackgram-Vegetables/ Blackgram- Lentil Tulsi-Lentil/ Tulsi-Chickpea Direct seeded rice (DSR) with short duration (80-90 days) varieties (Turanta dhan, Prabhat, Anjali, Vandana, CR-Dhan-40 etc.) can be taken up in midlands till the end of August subject to availability of at least one assured irrigation	<ul style="list-style-type: none"> Direct seeding of rice Mat nursery (dapog method)/ Community nursery can be raised for quick availability of young seedlings for transplanting of medium duration varieties by first fortnight of August Use of 20 days old dapog seedling in rice. Enhanced basal dose of NPK in rice to boost early vegetative growth Supply of contingency crop 	

			Early Rice-Prabhat, Dhanlaxmi, Richharia, Turanta	<p>seeds of Toria, Maize (QPM varieties, Swann composite-65-70 days; HM-4 hybrid baby corn), Arhar (Bahar, NDA1, Pusa 9), Urd (Navin and T9), Cowpea and Horsegram need to be ensured for taking up of sowing in September in midlands</p> <ul style="list-style-type: none"> • 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 	
	Lowland	Rice-Wheat/ Rice-Oilseeds Rice-Vegetables/ Rice-Potato/ Rice-Lentil/ Rice-Chickpea	Rice(Short duration)-Wheat/ Blackgram- Late wheat/ Blackgram-Vegetables/ Blackgram- Lentil/ Tulsi-Lentil / Tulsi-Chickpea Rice- Prabhat, Dhanlaxmi, Richharia	<ul style="list-style-type: none"> • Double 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. • 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 	

				<p>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>.</p> <ul style="list-style-type: none"> 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 	
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Oilseeds/ Rice –Vegetables/ Rice –Potato Rice: Prabhat, Dhanlaxmi, Richharia, Turanta	<ul style="list-style-type: none"> Gap filling if needed Life saving irrigation 	<ul style="list-style-type: none"> Mulching Tillage conservation Inter cultivation Mechanical weeding Life saving irrigation 	Seeds from BRBN, BAU, Sabour, NSC, TDC

1 st week of July	Medium Land	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato Rice : Rajendra Bhagawati, Rajendra Suwasini, Saroj, Rajendra Kasturi, Santosh			
	Lowland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetable/ Rice –Potato Rice: Rajshree, Sakuntala, Satyam, Kishori, Rajendra Sweta, Rajendra Mashuri			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Upland	Rice –Wheat/ Rice –Pulses/ Rice –Mustard/ Rice –Vegetables/ Rice –Potato Rice: Prabhat, Dhanlaxmi, Richharia, Turanta,	<ul style="list-style-type: none"> • Gap filling of existing crop • Postponement of top dressing 	<ul style="list-style-type: none"> • 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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Upland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea Rice: Prabhat, Richharia , Dhanlaxmi, Turanta	<ul style="list-style-type: none"> • Postponement of top dressing of nutrients • Life saving irrigation 	<ul style="list-style-type: none"> • 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	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Upland	Rice-Wheat/ Rice –Lentil/ Rice –Chickpea/ Rice-Mustard/ Rice-Rai/ Rice-Linseed Rice:Prabhat, Richharia , Dhanlaxmi, Turanta	<ul style="list-style-type: none"> • Foliar application with 2% MOP • Mulching • Life saving irrigation • 	<ul style="list-style-type: none"> • 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			

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	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	<ul style="list-style-type: none"> ❖ 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 recharge due to low rainfall	Upland/Medium land	Rice – Wheat	Cucurbits-Wheat/ 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	<ul style="list-style-type: none"> ❖ Mulching for moisture conservation • Foliar application with 2% MOP in standing crops ❖ Use of FYM/compost/Vermicompost ❖ Mechanical weeding 	Seeds from BRBN, BAU, Sabour, NSC, TDC

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			Horsegram: DB-7, BR-5, BR-10, Coimbatore-1 Sorghum: P-C 23, M-P Chari Mithi Sudan Tulsi – Cimsomaya		

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				
Rice	<ul style="list-style-type: none"> • Drainage management • Gap filling, if required • Resowing through drum seeder • Re transplanting through Dapog nursery if needed 	<ul style="list-style-type: none"> • Drainage management • Subsequent crop like Toria may be taken if present crop is substantially damaged/affected 	<ul style="list-style-type: none"> • Drainage management • Harvest at physiological maturity 	<ul style="list-style-type: none"> • Proper drying • Safer storage and Transportation
Maize	<ul style="list-style-type: none"> • Drainage management • Gap filling, if needed • Resowing, if sequentially affected • Sowing on ridges and furrows should be adopted 	<ul style="list-style-type: none"> • Drainage management • Alternative Rabi maize or other rabi crop if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Harvest at physiological maturity 	<ul style="list-style-type: none"> • Proper drying • Safer storage and Transportation
Pigeonpea	<ul style="list-style-type: none"> • Drainage management • Gap filling if needed • September sowing of pigeonpea if Kharif Arhar is completely affected • Sowing on ridges and furrows should be adopted 	<ul style="list-style-type: none"> • Drainage management 		<ul style="list-style-type: none"> • Proper drying • Safer storage and Transportation
Horticulture				
Mango, Litchi, Guava, Papaya, Banana	<ul style="list-style-type: none"> • Drainage management • Gap filling • Replanting if completely damaged 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	

Heavy rainfall with high speed winds in a short span				
Rice	❖ Drainage management ❖ Gap filling ❖ Replanting with Dapog seedlings ❖ Kharuhan (double transplanting)	❖ Drainage management ❖ Alternative crop if completely failed	❖ Drainage management ❖ Harvest at proper time	❖ Proper drying ❖ Safer storage and Transportation
Maize	❖ Drainage management ❖ Gap filling ❖ Replanting ❖ Earthing up	❖ Drainage management ❖ Alternative crop if completely failed	❖ Drainage management ❖ Harvest at proper time	❖ Proper drying ❖ Safer storage and Transportation
Pigeonpea	❖ Drainage management ❖ Gap filling ❖ Resowing	❖ Drainage management ❖ Alternative crop if completely failed	❖ Drainage management ❖ Harvest at proper time	❖ Proper drying ❖ Safer storage and Transportation
Horticulture				
Mango	❖ Drainage management ❖ Replanting or Gap filling	❖ Drainage management	❖ Drainage management ❖ Harvest at proper time	
Litchi	❖ Drainage management ❖ Replanting or Gap filling	❖ Drainage management	❖ Drainage management ❖ Harvest at proper time	
Guava	❖ Drainage management ❖ Replanting or Gap filling	❖ Drainage management ❖ Pesticides spray	❖ Drainage management ❖ Harvest at proper time	
Papaya	❖ Drainage management ❖ Replanting or Gap filling as the case may be	❖ Drainage management ❖ Pesticides spray	❖ Drainage management ❖ Harvest at proper time	
Banana	❖ Drainage management ❖ Replanting or Gap filling	❖ Drainage management ❖ Pesticides spray	Drainage management Harvest at proper time	
Outbreak of pests and diseases due to unseasonal rains	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Rice	❖ Seedling treatment with granular insecticide – Cartap hydrochloride or phorate 10G or carbofuran 3G. ❖ Maintain shallow water in nursery beds ❖ Providing good drainage.	❖ Use copper fungicides against Bacterial leaf blight. ❖ Split application of N fertilizer (3-4 times)	❖ Harvest at physiological maturity	Proper drying and safe storage

Maize	<ul style="list-style-type: none"> ❖ Drainage, and yellowing mainly due to nitrogen deficiency apply N split doses ❖ Application of granular insecticides viz. Carbofuran 3g. in whorl of maize 	<ul style="list-style-type: none"> ❖ 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) 	<ul style="list-style-type: none"> ❖ Cob harvesting from standing crop ❖ Harvest at physiological maturity 	<ul style="list-style-type: none"> ❖ Storage in safe places like farmer warehouse/tent covering of produce ❖ Ensure 10-12% moisture in grains before storage ❖ Proper drying
Pigeonpea	<ul style="list-style-type: none"> ❖ Provide drainage ❖ Seed treatment with 1 g carbendizim +2g thiram/kg seed. 	Provide drainage	Provide drainage	<ul style="list-style-type: none"> ❖ Proper drying ❖ Storage at safe place and transportation
Wheat			Harvest at physiological maturity	Proper drying, Storage at safe place and transportation
Lentil			Harvest at physiological maturity	Proper drying, Storage at safe place and transportation
Horticulture				
Vegetables	• Drainage management	• Drainage management	• Drainage management	

Mango	<p>Anthracnose:- The foliar infection can be controlled by spraying of copper oxychloride (0.3%)</p> <p>Use bio control agent viz <i>Streptosporangium pseudovulgare</i></p> <p>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.</p>	<p>Anthracnose:- Apply Carbendazim/ Thiophanate methyl (1g/lit) to control of Anthracnose. Blossom infection can be controlled effectively by spraying of Bavistin (0.1%) at 15 days interval.</p> <p>Mango powdery mildew: Spray wettable sulphur(0.2%) & calixin or karathane (0.1%) during second week of December</p>	<p>Mango powdery mildew: Prune diseased leaves and malformed panicles harbouring the pathogen to reduce primary inoculum load.</p> <p>Spray wettable sulphur (0.2%) when panicles are 3-4" in size</p> <p>Spray dinocap (0.1%) 15-20 days after first spray. Spray tridemorph (0.1%) 15-20 days after second spray.</p> <p>Spraying at full bloom needs to be avoided.</p> <p>Mango bacterial canker: Three sprays of Streptocycline (200 ppm) at 10 days intervals reduce fruit infection.</p> <p>In severe infection, spraying of Streptocycline (300 ppm) or copper oxychloride (0.3%) is more effective.</p>	<p>Harvest at proper time</p> <p>Anthracnose:- Pre-harvest sprays of hexaconazole (0.01%) 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.</p> <p>Diseased leaves, twigs, and fruits, should be collected and burnt to avoid the spread for next season</p>
Litchi	<p>Fruit Fly: Monitor adult fruit flies emergence by using methyl eugenol or sex pheromone traps.</p>	<p>Fruit Fly: First Spray delta menthrin 0.0025% plus molasses 0.1% . after 10-12 days spray fenthion 0.05% + molasses 0.1% followed by dimethoate 0.045% + molasses 0.1% if required</p>	<p>Harvest at proper time</p>	<p>Fruit Fly: Collect all fallen infested fruits and put in a drum covered with fine wire mesh. Harvest fully matured fruits one week earlier to escape egg laying</p>
Banana			Harvest at proper time	
Papaya			Harvest at proper time	
Guava			Harvest at physiological maturity	

2.3 Floods

Condition	Suggested contingency measures			
Transient water logging/ partial inundation ¹	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Rice	<ul style="list-style-type: none"> • Drainage management • Resowing, if completely damaged 	<ul style="list-style-type: none"> • Drainage management • Gap filling • Transplanting of 40-45 days old seedling • Double transplanting through Kharuana 	Lentil as Paira crop	<ul style="list-style-type: none"> • Proper drying • Safer storage • Transportation
Maize	<ul style="list-style-type: none"> • Drainage management • Replanting , if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Resowing if completely damaged • Toria if standing crop damaged 	Lentil if standing crop damaged	<ul style="list-style-type: none"> • Proper drying • Safer storage • Transportation
Pigeonpea	<ul style="list-style-type: none"> • Drainage management • Resowing, if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Rabi Maize if standing crop damaged 	Spring maize Var. Suwan if crop is substantially damaged	<ul style="list-style-type: none"> • Proper drying • Safer storage • Transportation
Horticulture				
Mango	<ul style="list-style-type: none"> • Drainage management • Gap filling • Replanting, if substantially damaged 	<ul style="list-style-type: none"> ❖ Drainage management ❖ Drenching with copper fungicide 	<ul style="list-style-type: none"> ❖ Drainage management ❖ Drenching with copper fungicide ❖ Harvest at proper time 	
Litchi	<ul style="list-style-type: none"> • Drainage management • Gap filling • Replanting, if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicide 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicide • Harvest at proper time 	
Guava	<ul style="list-style-type: none"> • Drainage management • Gap filling • Replanting, if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicide 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicide • Harvest at proper time 	
Continuous submergence				

for more than 2 days²				
Rice	Re-transplanting if damaged after receding of floods	Re-sowing, gap filling	Toria/late wheat, if substantial damaged	Storage at safe place
Maize	Re-sowing, if damaged after receding of floods	Re-sowing, gap filling	Toria/late wheat, if substantial damaged	Storage at safe place
Pigeonpea	Re-sowing, if damaged after receding of floods	Re-sowing, gap filling	Rabi maize/Summer maize, if substantial damaged	Storage at safe place
Horticulture				
Mango	❖ Drainage management ❖ Replanting if damaged	❖ Drainage management ❖ Replanting	❖ Drainage management	
Litchi	❖ Drainage management ❖ Replanting if damaged	❖ Drainage management ❖ Replanting	❖ Drainage management	
Guava	❖ Drainage management ❖ Replanting	❖ Drainage management ❖ Replanting	❖ Drainage management • Use of fungicide with the use of nitrogenous fertilizer and manure	
Sea water intrusion	Not Applicable			

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Maize, Pigeonpea, Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Horticulture				
Mango, Litchi, Guava	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Cold wave				
Maize, Pigeonpea, Wheat, Lentil		<ul style="list-style-type: none"> • Light irrigation • Mulching 		

Horticulture				
Mango, Litchi, Guava	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Frost				
Maize, Pigeonpea, Wheat		<ul style="list-style-type: none"> • Light irrigation • Mulching 		
Horticulture				
Mango, Litchi, Guava	Provide irrigation , Creation of smoke to generate heat			
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			
Floods			
Feed and fodder availability	<ol style="list-style-type: none"> 1. Advance planning for cultivation of fodder tree 2. Storage of Improved Quality Fodder 3. Conservation & Storage of <ul style="list-style-type: none"> • Feed & Fodder • Hay & Silage: — Preserve the fodder in the form of hay from Berseem & other grasses as well as silage from <ol style="list-style-type: none"> (a) Maize- harvesting at well developed cob. (b) Jowar - at flowering stage. 	<ol style="list-style-type: none"> 1. Feeding of Complete Feed Block 2. Feeding of Urea-Molasses-Mineral-Block & Fodder 3. Feeding of stored Hay/Silage/Improved Quality Fodder 4. Feeding of Tree leaves some of which are as follows: <ol style="list-style-type: none"> 1. Bamboo leaves 2. Neem 3. Bargad 4. Peepal 5. Seesam 	Production of forage crops <ol style="list-style-type: none"> 1. Balanced feeding of Animal supported with little higher concentrate mixture 2. Cultivation of fodder Rabi maize if water stagnated upto Nov/ December 3. Sorghum/Cowpea 4. Maize in September

	<p>(c) Oat</p> <p>(d) Hybrid Napier – 40-45 day old.</p> <p>(e) Water hyacinth mixing with Rice straw in ratio of 4:1 with 70 kg molasses /ton of clean water hyacinth.</p> <p>(f) Potato leaves mixing with wheat straw in ratio of 7:1 and should be supplemented with 3% molasses.</p> <p>Hay: –</p> <ul style="list-style-type: none"> • Berseem/Lucerne and other grasses. • Bales of hay and other dry fodder should be stored in dry places at a height of last flood level and covered with asbestos sheet or polythene sheet. <p>4. Development & storage of: –</p> <p>(a) Complete Feed Block (CFB)</p> <p>(b) Urea-Molasses-Mineral-Block (U.M.M.B)</p> <p>5. Development of Fodder Bank</p>	<p>6. Subabul</p> <p><u>Use of unconventional feed stuff:</u></p> <p>(i) Aquatic Plants – water hyacinth</p> <p>(i) Lotus</p> <p>(ii) Aquatic weeds</p>	
Drinking water			
Health and disease management	<p>Veterinary Preparedness with Medicines, Vaccines and provision for mobile ambulatory van.</p> <ul style="list-style-type: none"> • Vaccination <p>During flood stress becomes an incriminating factor for the precipitation of diseases in livestock and poultry.</p> <p>So, necessary vaccination of livestock and poultry should be done against economically important contagious disease.</p>	<p>Animal safety, Health camp and Treatment</p> <p>Important Suggestions for animal and Poultry safety</p> <p>During flood, all efforts should be made to rescue most of the livestock and poultry as carefully as possible.</p> <p>The people should be made conscious through announcement with the help of mikes or other means of communication, so that they may</p>	<p>Sanitation, deworming, treatment, health camps Culling of Sick animals and disposal of carcass</p> <p>Maintenance of Sanitation: Adequate attention is to be paid to disinfect the premises of temporary sheds with the help of bleaching powder, phenol, carbolic acid etc. In no case the carcass/ cadaver should come in contact with healthy animals rehabilitated in sheds. Arrangements should be made</p>

	<p>This will be helpful not only to check epidemic in animals, but also to reduce the probability of zoonoses in human beings.</p> <p>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.</p> <p>Mass vaccination should be conducted by a team of Department staff with proper maintenance of detailed Inoculation Register.</p> <p>Pro-active steps should be taken to receive and stock the required doses of vaccines against different diseases for their use in face of Flood.</p>	<p>escape with their livestock and poultry to safe area.</p> <p>The fisherman or the people who knows swimming should be deputed for the rescue of drowning and floating animals and birds.</p> <p>During flood do not leave halter or headstalls on animals.</p> <p>Do not tie animals together when releasing.</p> <p>Report the location, identification and disposition of livestock and poultry to authorities handling the disaster.</p> <p>Health camp and treatment</p> <p>Water borne diseases are one of the most common phenomena during the flood</p> <p>Diarrhoeal diseases outbreaks can occur after drinking contaminated water.</p> <p>Diseases that can occur during flood should be given special attention and</p>	<p>accordingly.</p> <p>De-worming after the flood: Immediately after flood, the animals like cattle, buffalo. Sheep, goat, pig, dog and poultry need to be de-wormed with suitable broad spectrum anthelmintics. This will enable the animals to regain proper health.</p> <p>In water logged area, snails can be introduced as biological control measures against snails to protect livestock from parasitic disease.</p> <p>Treatment of sick animals: The Disposal of Carcass: the disposal of dead animals and birds are to be done by Animal Husbandry Department. Accordingly, necessary arrangement should be made for prompt and easy disposal of carcasses during the Flood and Post-Flood period.</p> <p>Carcasses of animals affected by the disease are the chief source of soil</p>
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		<p>accordingly medicines should be available in the health camp for the following mentioned diseases.</p> <p>Salmonella spp. Escherichia coli Giardiasis Amoebiasis Rotavirus Leptospirosis Scabies Black leg Malignant Edema Foot rot Anthrax Botulism Tetanus Red water Black disease Entertoxemia Liver fluke Amphistomiasis Brooders pneumonia</p> <p>Treatment of Non infectious Arrangement should be made for the treatment of drowning and traumatic injuries, aspiration pneumonia, lameness and other surgical cases in the health camp.</p> <p>Disinfection of livestock premises and Poultry shed Disinfection of livestock premises and the temporary sheds should be done with the help of bleaching powder, phenol, carbolic</p>	<p>infection. They harbour the germs in large numbers and liberate them from both artificial and natural body openings into the surrounding soil.</p> <p>Methods of Carcass disposal to be adopted</p> <p>Burial</p> <p>Burning</p> <p>Composting</p> <p>Vulturing</p> <p>s. Health Camp after the flood:</p> <p>Protection of livestock from out breaking and communicable diseases be made. Health camps are to be organised in Flood affected areas to restore the normal breeding capability of breedable population as well as to restore the normal health of livestock and poultry.</p>
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		acid etc	
Cyclone			
Heat wave and cold wave	Adequate and suitable measures for safety of animal lifes		

2.5.2 Poultry etc.

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought				
Floods				
Shortage of feed ingredients				
Drinking water				
Health and disease management	<p>Vaccines to be used for different animals and Poultry</p> <p>Cattle and Buffalo Hemorrhagic Septicemia Vaccine Black Quarter Vaccine FMD Vaccine Anthrax Vaccine as per endemicity.</p> <p>Sheep and Goat Hemorrhagic Septicemia Vaccine PPR Vaccine FMD Vaccine</p>			

	<p>Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity</p> <p>Pigs</p> <p>Hemorrhagic Septicemia Vaccine PPR Vaccine FMD Vaccine Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity.</p> <p>Dogs</p> <p>Rabies Vaccine</p> <p>Poultry</p> <p>Mareks disease vaccine RDV (F₁ & R₂B), FPV, IBRV & IBDV</p> <p>(Annexure-1)</p> <ul style="list-style-type: none"> • Medicines <p>All Districts should be earmarked for flood.</p> <p>An inventory of required medicines to treat the affected livestock in case of eventualities should be made.</p> <p>The Govt. should take steps to procure sufficient quantity of essential life saving medicines.</p> <p>List of life saving Medicines</p> <p>Corticosteroids Nikethamide Antibloat Adrenaline Antihistaminic Antidotes for common poisoning</p>			
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	<p>Antisnake venom Broad spectrum antibiotics Anti-inflammatory Antipyretic and Analgesics Fluids and Electrolytes</p> <ul style="list-style-type: none"> • Mobile Veterinary Clinics <p>Mobile Veterinary Clinics should be kept ready at Veterinary Hospital or Veterinary Camps so that immediate treatment of injured and affected animals may be done.</p> <p>For this MVC must have adequate drugs like antibiotic, analgesic, de wormer, ointment, antisnake venom and emergency health care facilities along with trained personnel.</p> <p>A good no. of mobile clinic teams should be planned consisting dedicated and experienced technical workers with allotment of area of operation.</p> <p>The teams should be kept in readiness having required stock of medicines and equipment to work in any adverse situation.</p> <p>A telephone directory should be maintained at the District level by collecting the telephone nos. of Vets, Para-Vets, NGOs / youth clubs / societies, volunteers etc. to collect feedback and plan the activities during the emergency.</p> <p>An emergency kit for poultry should be made ready well in advance. The Poultry kit should have Cage, mask, mash, pellet feed trough, waterers, detergents, poultry</p>			
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	vaccines, Veterinary drugs, workers protection uniform etc.			
Cyclone				
Heat wave and cold wave				

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	(i) Thinning of population (ii) Arrangement of water supply from external resource	(i) Partial harvesting (ii) Addition of water (iii) Stocking of air breathing fishes	(i) Maintenances of remaining stock till favorable condition achieved (ii) If not feasible, total harvesting or transfer of fishes may be done. (iii) Preparation of the pond for next crop.
(ii) Impact of salt load build up in ponds / change in water quality	(i) Regular monitoring of water quality parameter. (ii) Arrangement of aeration (iii) Addition of water from external resource	(i) Arrangement of aeration. (ii) Addition of water a. Monitoring of water quality b. Reduction of manuring according to water level.	
2) Floods			
A. Capture			
B. Aquaculture			
(i) Inundation with flood water	(i) Elevation/ Renovation of pond dyke. (ii) Sale of Table/marketable size fishes (iii) construction of earthen nursery ponds in upland areas	Collection of naturally bred seeds (Spawn /fry /fingerling) from flooded water Stocking in nursery ponds for rearing	-Retain the water in pond immediately after flood through repairing of damaged dyke etc. -Netting of pond

			-Removal of unwanted, predatory/weed fishes -Sell of large size fishes
(ii) Water contamination and changes in water quality	Arrangement of regular water quality monitoring		
(iii) Health and diseases	(a) Use lime/ potassium permanganate (b) Arrangement of CIFAX and medicines & chemical stock		-Sampling of fishes and water for disease analysis - Liming, use of drugs/ medicine if required in consultancy of fisheries experts
(iv) Loss of stock and inputs (feed, chemicals etc)	Raising the height of dyke by fencing with net and bamboo poles to prevent loss of stock	Arrangement of advance size fingerling/ yearlings for stocking	Stocking of large size fingerlings carp Fertilization of pond and regular feeding of fish Harvesting and sale of fish
(v) Infrastructure damage (pumps, aerators, huts etc)	Repairing/ arrangement of alternate safe place to keep pumps aerators etc.	A regular water on the flood and infrastructure facilities.	Re establishment of the infra structural facility.
3. Cyclone / Tsunami			
4. Heat wave and cold wave			