

State: BIHAR

Agriculture Contingency Plan for District: JAMUI

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)	(Bhojpur, Patna, Nalanda, Nawada, Rohtas, Aurangabad, Gaya, Buxer, Jahanabad, Bhagalpur, Kaimur, Banka, Shekhpura, Munger and Jamui)		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		24 ⁰ 55 ['] 24 ⁰ 92 ['] N	85 ⁰ 13 ['] E	86.2 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Agriculture Research Institute, Patna		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Shramabharati Khadigram, Jamui, Bihar-811313		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Krishi Vigyan Kendra, Shramabharati Khadigram, Jamui, Bihar-811313		

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	920.1	62	2 nd week of June	2 nd week of October
	NE Monsoon(Oct-Dec)	--	--		
	Winter (Jan- March)	72.5	05	-	-
	Summer (Apr-May)	104.5	07	-	-
	Annual	1097.1	74	-	-

1.3	Land use pattern of the district (latest statistics)	Geogra- phical area	Cultivable area	Forest area	Land under non- agricultu ral use	Permane nt pastures	Cultivab le wastelan d	Land under Misc. tree crops and groves	Barren and uncultiv able land	Current fallows	Other fallows
	Area ('000 ha)	312.200	76.950	38.680	NA	21.00	44.90	NA	30.20	13.50	NA

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	1. Sandy Loam (Deep soil)	55.000	46.4
	2. Red and lateritic soil (Low deep soil)	36.000	30.6
	3. Clay Loam (Medium deep soil)	28.000	23.6

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	95.000	125%
	Area sown more than once	60.000	
	Gross cropped area	119.000	

1.5	Irrigation	Area ('000 ha)		
	Net irrigated area	28.900		
	Gross irrigated area	38.000		
	Rainfed area	66.100.		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	18	0.900	2.36
	Tanks	19	0.200	0.52
	Open wells		2.880	7.58
	Bore wells		26.880	70.74
	Lift irrigation schemes		NA	
	Micro-irrigation		NA	
	Other sources (please specify)		12.000	31.58
	Total Irrigated Area		38.000	
	Pump sets		NA	
	No. of Tractors		NA	
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)	
1.6	Over exploited			
	Critical			
	Semi- critical			
	Safe	10	100%	Safe
	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 (2008-09)

1.7	S. No.	Major field crops cultivated	Area ('000 ha)							
			<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Rice	-	-	73.0	-	-	0	-	73.0	
2	Wheat	-	-	0	-	-	22.0	-	22.0	
3	Maize	-	-	6.30	-	-	3.80	-	10.1	
4	Lentil	-	-	-	-	-	3.00	-	3.0	
5	Mustard	-	-	-	-	-	1.00	-	1.0	
6	Linseed	-	-	-	-	-	1.00	-	1.0	
7	Other legumes	-	-	-	-	-	-	0.45	4.5	
8	Others	-	-	-	-	-	3.02	-	3.02	

S. No.	Horticulture crops – Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
1	Mango	1.028	-	-
2	Guava	0.221	-	-
3	Banana	0.412	-	-
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
1	Potato	3.315	-	-
2	Onion	0.732	-	-
3	Chilli	0.862	-	-
4	Onion	0.732	-	-
5	Brinjal	0.578	-	-

		Medicinal and Aromatic crops	Total	Irrigated	Rainfed
	1	Tulsi	.002	-	-
	2	Kalmegh	.001	-	-
	3	Ashwagandha	.001	-	-
	4	Lemon grass	.001	-	-
	5	Citronella	.001	-	-
		Plantation crops	Total	Irrigated	Rainfed
		Fodder crops	Total	Irrigated	Rainfed
		Total fodder crop area	-	-	-
		Grazing land	-	-	-
		Sericulture etc	-	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	39.000	22.000	61.000
	Improved cattle	-	-	-
	Crossbred cattle	1.92	3.96	5.900
	Non descriptive Buffaloes (local low yielding)	-	-	-
	Descript Buffaloes	16.000	61.000	77.000

	Goat	-	-	0.299		
	Sheep	-	-	.001		
	Others (Camel, Pig, Yak etc.)	-	-	.026		
	Commercial dairy farms (Number)					
1.9	Poultry	No. of farms	Total No. of birds ('000)			
	Commercial	-	246.800			
	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)	
	ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds	No. of Reservoirs		No. of village tanks	
		NA	NA		NA	
	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)		580.00	3.2/ha	916	
Others						

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08;)

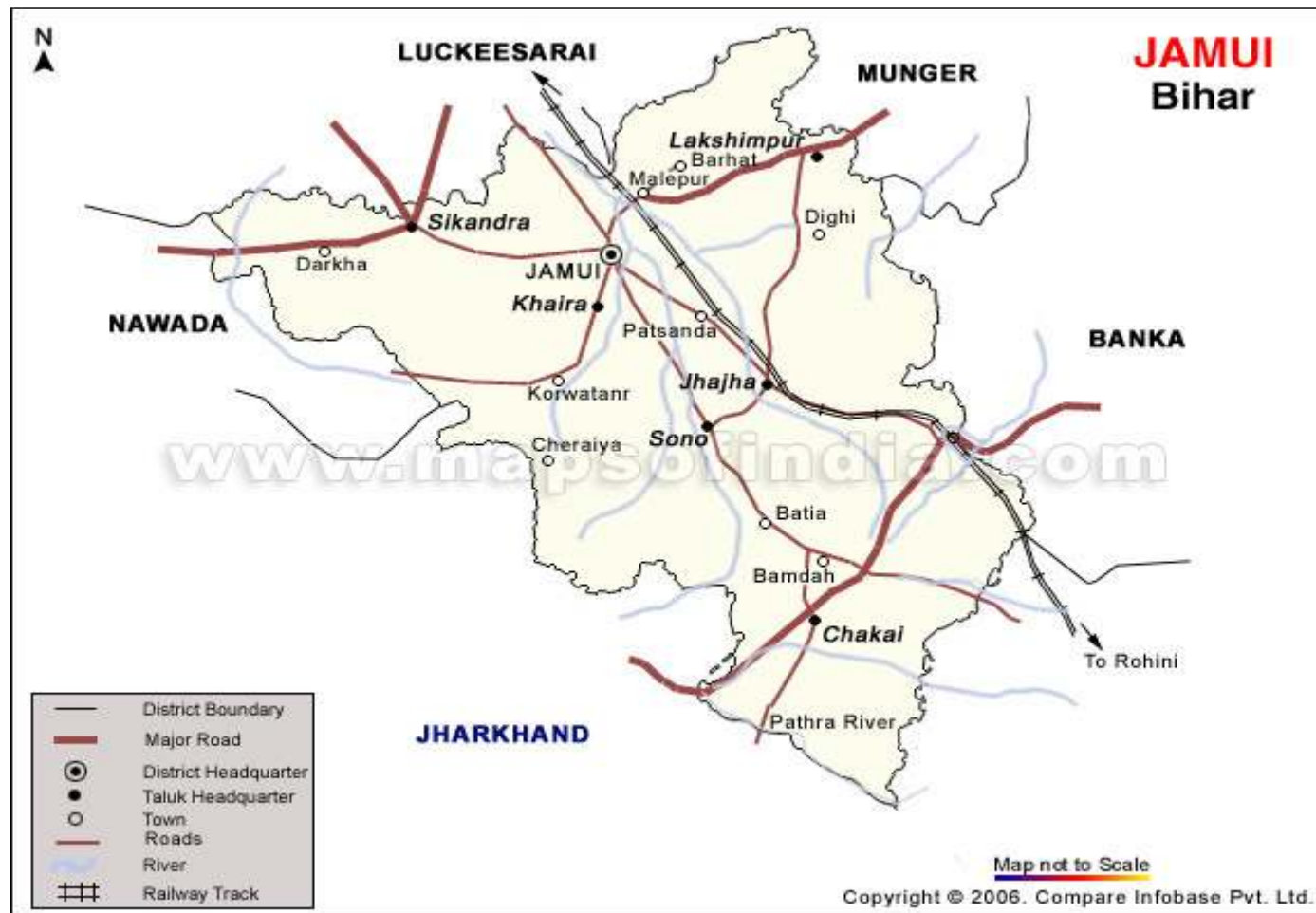
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
1	Rice	160.6	2200	-	-	-	-	160.6	2200	-
2	Wheat	-	-	33.8	1500	-	-	-	-	-
3	Maize	-	-	-	-	-	-	25.4	2500	-
4	Sugarcane	-	-	-	-	-	-	102.7	34000	-
Major Horticultural crops (Crops to be identified based on total acreage)										
1	Mango	-	-	-	-	-	-	9.792	9525	-
2	Banana	-	-	-	-	-	-	8.637	20963	-
3	Guava	-	-	-	-	-	-	1.995	9027	-
4	Lemon	-	-	-	-	-	-	1.251	-	-
5	potato	-	-	2.6	4000	-	-	2.600	4000	-

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Wheat	Maize	Lentil	Potato
	<i>Kharif</i> - Rainfed	3 rd week of June to 4 th week of July	-	-	-	-
	<i>Kharif</i> - Irrigated	-	-	-	-	-
	<i>Rabi</i> - Rainfed	-	-	-	3 rd week of October to 4 th week of November	-
	<i>Rabi</i> - Irrigated	-	2 nd week of November to 4 th week of December	2 nd week of October to 2 nd week of November	-	2 nd week of October to 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	√			

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: No

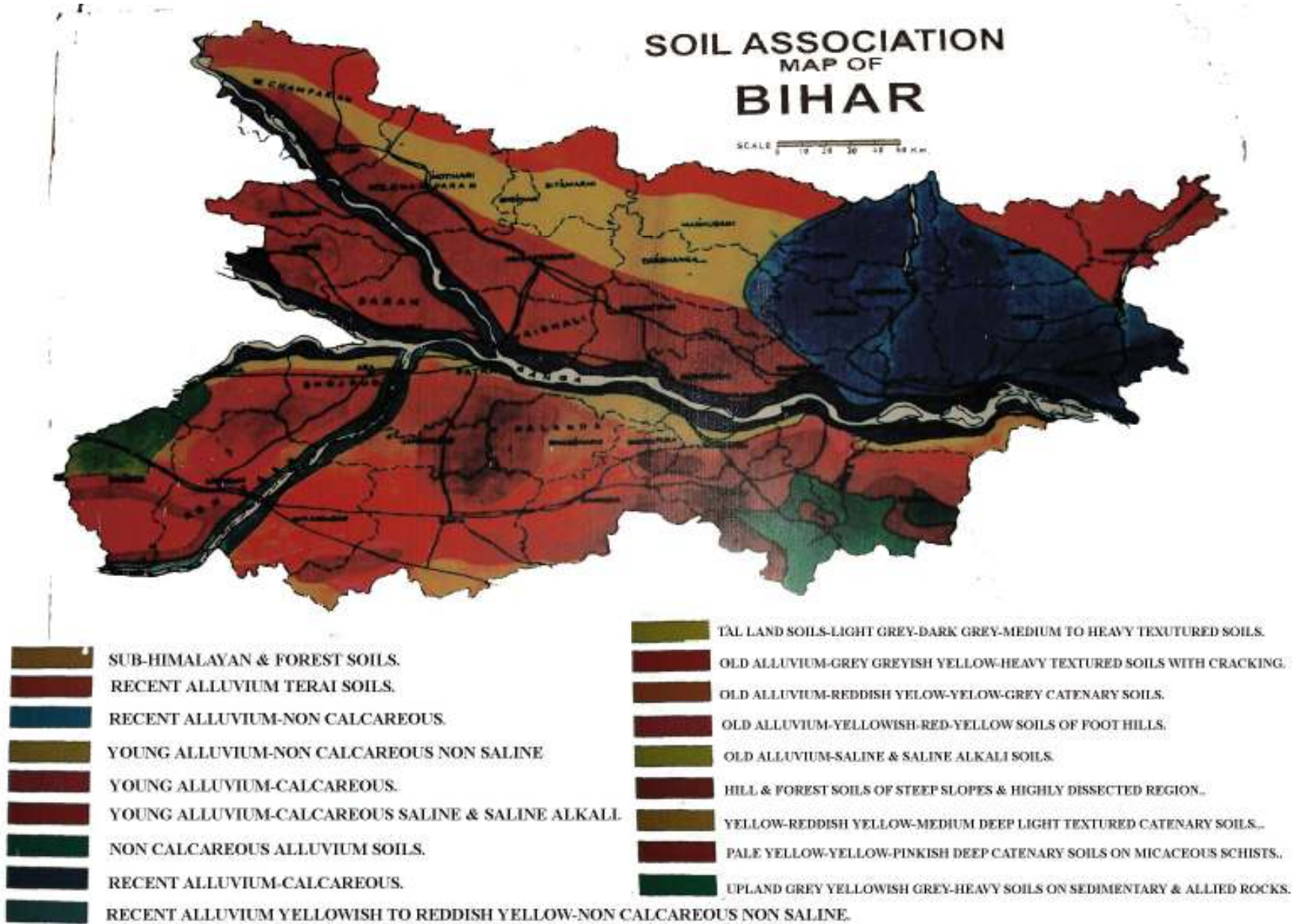
Annexure-1



Annexure-2

ANNUAL RAINFALL & TEMPERATURE





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 4 th week of June	Up land Medium to low deep soil Sandy loam to clay loam soil	1.Maize- Fallow 2. Pigeonpea- Fallow	Maize-Pigeonpea Maize Shaktiman-1,2,3,4 Suwan, Ganga-11,Deoki, Pusa early hybrid Maka-3 Extra Early Pigeonpea ICPL- 8803	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation • Use of mulches • Gap filling 	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Mid land	1.Rice- Wheat 2.Rice- Maize	Rice –Wheat Rice-Maize Medium duration Rice Rice – Pusa 2-21, Rajendra Suwasni,Sita Safed Wheat- HD-2733, PBW-343, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki,	<ul style="list-style-type: none"> • Normal package of Practices • Direct seeding of rice can be done • Life saving irrigation 	

			Pusa early hybrid Maka-3		
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
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram	Rice- Wheat Rice- Maize- Greengram Medium to long duration Rice- Rajendra Suwasni, Rajendra Sweta Rajendra Mansoori-1 Wheat- HD-2733, PBW-343, K-9107, HP-1731 Greengram Pusa Bashaki, SML 668, Samrat PDM-54	<ul style="list-style-type: none"> • Normal package of Practices • Direct seeding of rice can be done • Life saving irrigation • Gap filling 	
Delay by 4 weeks 2 nd week of July	Up land Medium to low deep soil Sandy loam to clay loam soil	Maize- Fallow Pigeonpea- Fallow	Maize-Pigeonpea Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Extra Early Pigeon pea ICPL- 88039 Bahar	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation • Use of mulches • Gap filling • Balanced dose of 	Seeds from BRBN, RAU, Pusa, NSC, TDC

				NPK	
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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)	Mid land	1.Rice- Wheat 2.Rice- Maize	Rice –Wheat Rice-Miaze Short duration Rice Rice – , Prabhat, Richarria Dhanlaxmi, Turanta Wheat- HD-2733, PBW-343, HP-1731 Maize- Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3	<ul style="list-style-type: none"> ▪ Normal seedling of rice can be used with adequate NPK ▪ Old age 30-35 days seedlings of early rice variety may also be used ▪ Direct seeding of rice 	

	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram	1.Rice- Wheat 2.Rice- Maize- Green gram Medium duration Rice- Rajendra Suwasni Prabhat , Sita safed Wheat- HD-2733, PBW-343, HP-1731 Greengram- Pusa Bashakhi, SML 668, PDM-54	<ul style="list-style-type: none"> • Enhanced dose of nitrogen with full basal dose of NPK at transplanting • Old age rice seedling of 40-45 days may be used with three seedling per hill with close spacing 	
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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)					
Delay by 6 weeks 4 th week of July	Up land Medium to low deep soil Sandy loam to clay loam soil	1.Maize- Fallow 2.Pigeonpea- Fallow	Finger millet Finger millet- DB-7, BR-5, BR-10, Coimbatore-1	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation • Adequate dose of NPK • IPM 	Seeds from BRBN, RAU, Pusa, NSC, TDC

	Mid land	1.Rice- Wheat 2. Rice- Maize	Finger millet – Linseed Finger millet- DB-7, BR-5, BR-10, Coimbatore-1 Linseed- Subhra, Shekhar	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation • Adequate dose of NPK • IPM 	
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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
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram	Mustard & Chickpea Wheat- Greengram Mustard: Rajendra Suflam Rajendra sarson-1 Wheat: HD-2733, PBW-343, HD-2824 Greengram: Pusa Bashakhi, SML 668, PDM-54	<ul style="list-style-type: none"> • Application of Potassic fertilizer at vegetative stage • Protective spray of pesticides • Enhanced basal dose of NPK • Adequate dose of NPK • IPM 	Seeds from BRBN, RAU, Pusa, NSC, TDC

Delay by 8 weeks 2 nd week of August	Up land Medium to low deep soil Sandy loam to clay loam soil	1.Maize- Fallow 2.Pigeonpea- Fallow	Finger millet- Fallow Chickpea- Fallow Finger millet- DB-7, BR-5, BR-10, Coimbatore-1 Chickpea- Pusa-236, KPG-39 (Uday) , Pusa-372, SG-2	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation 	Seeds from BRBN, RAU, Pusa, NSC, TDC
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
	Mid land	1.Rice- Wheat 2.Rice- Maize	Finger millet – Linseed Finger millet- DB-7, BR-5, BR-10, Coimbatore-1 Linseed- Subhra, Shekhar	<ul style="list-style-type: none"> • Normal package of Practices • Life saving irrigation • Adequate dose of NPK • IPM 	
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram	1.Mustard +Chickpea 2.Wheat- Greengram Mustard: Rajendra suflam Rajendra sarson-1 Wheat: HD-2733, PBW-	<ul style="list-style-type: none"> • Application of Potassic fertilizer at vegetative stage • Protective spray of pesticides <ul style="list-style-type: none"> • Enhanced basal dose of NPK 	

			343, HD-2824 Chickpea- Pusa-236, KPG-39 (Uday) , Pusa- 372, SG-2 Greengram: Pusa Bashakhi, SML 668, PDM-54		
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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.	Up land Medium to low deep soil Sandy loam to clay loam soil.	1.Maize- Fallow 2.Pigeonpea- Fallow Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Pigeonpea: NDA-1, NDA-2, Bahar, Malviya-9	<ul style="list-style-type: none"> Life saving irrigation Gap filling of existing crop 	<ul style="list-style-type: none"> Application of potash Mulching through mechanical weeding for moisture conservation Conservation tillage Protective spray of pest with adjuvant against Pesticides and disease 	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Medium land	1.Rice- Wheat 2.Rice- Maize Rice – Pusa 2-21, Rajendra Suwasni Prabhat , Sita safed	<ul style="list-style-type: none"> Normal package of Practices Direct Seeding of Rice 	<ul style="list-style-type: none"> Application of potash Use of Bio-fertilizers 	

		Wheat- HD-2733, PBW-343, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3	<ul style="list-style-type: none"> • Life saving irrigation • Gap filling 	<ul style="list-style-type: none"> • Spilt dose of urea fertilizer • Use of mulches 	
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Condition	Major Farming situation	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
Early season drought (Normal onset)					
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice- Sita safed Rajendra Suwasini, Rajendra Sweta Rajendra Mansoori-1 Wheat- HD-2733, PBW-343, PBW-502, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11,Deoki, Pusa early hybrid Maka-3	<ul style="list-style-type: none"> • Direct Seeding of Rice • Life saving irrigation • Gap filling 	<ul style="list-style-type: none"> • Application of potash • Use of Bio-fertilizers • Spilt dose of urea fertilizer • Use of mulches 	

		Greengram: Pusa Bashakhi, SML 668, PDM-54			
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Up land Medium to low deep soil Sandy loam to clay loam soil.	1.Maize- Fallow 2.Pigeonpea- Fallow Maize: Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3 Pigeonpea: NDA-1, NDA-2 Bahar, Malviya-9	<ul style="list-style-type: none"> • Life saving irrigation • Gap filling of existing crop 	<ul style="list-style-type: none"> • Application of potash • Mulching through mechanical weeding for moisture conservation • Conservation tillage • Protective spray of pesticides with adjuvant against Pest and disease 	Seeds from BRBN, RAU, Pusa, NSC, TDC

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

weeks rainless (>2.5 mm) period)					
	Medium land	<p>Rice- Wheat Rice- Maize</p> <p>Rice – Pusa 2-21, Rajendra Suwasni Prabhat , Sita safed</p> <p>Wheat- HD-2733, PBW-343, HP-1731</p> <p>Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3</p>	<ul style="list-style-type: none"> • Gap filling of existing crop • Postponement of top dressing • Protective spray of pesticides with adjuvant against BLB, BLAST & BPH • Life saving irrigation 	<ul style="list-style-type: none"> • Mulching through weeds, • Direct seeding of rice • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea on the crops and zinc sulphate 	

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)					

	Low land	<p>1.Rice- Wheat 2.Rice- Maize- Green gram</p> <p>Rice- Sita safed Rajendra Suwasni, Rajendra Sweta Rajendra Mansoori-1</p> <p>Wheat- HD-2733, PBW-343, HP-1731</p> <p>Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maka-3</p> <p>Greengram Pusa Bashakhi, SML 668, PDM-54</p>	<ul style="list-style-type: none"> • Gap filling of existing crop • Postponement of top dressing • Protective spray of pesticides with adjuvant against BLB, BLAST & BPH • Life saving irrigation 	<ul style="list-style-type: none"> • Mulching through weeds, • Direct seeding of rice • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea on the crops and zinc sulphate 	
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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
Mid season drought (long dry spell)	Up land Medium to low deep soil Sandy loam to clay loam soil.	1.Maize- Fallow 2Pigeonpea- Fallow Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Pigeonpea: NDA-1, NDA-2, Bahar, Malviya-9	<ul style="list-style-type: none"> • IPM practices • Life saving irrigation • Spray of pesticides with spreader 	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient 	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Medium land	1.Rice- Wheat 2.Rice- Maize Medium duration Rice Rice – Pusa 2-21, Rajendra Suwasni Prabhat , Sita safed Wheat- HD-2733, PBW-343, HP-1731 Maize- Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3	<ul style="list-style-type: none"> • IPM practices • Life saving irrigation • Spray of pesticides with spreader 	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient 	

Condition			Suggested Contingency measures		
Mid season	Major Farming	Normal Crop/cropping	Crop management ^c	Soil nutrient & moisture	Remarks on

drought (long dry spell)	situation	system		conservation measues	Implementation
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice- Sita safed Rajendra Suwasini, Rajendra Sweta Rajendra Mansoori-1 Wheat- HD-2733, PBW-343, PBW-502, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Greengram Pusa Bashakhi, SML 668, PDM-54	<ul style="list-style-type: none"> • IPM practices • Life saving irrigation • Spray of pesticides with spreader 	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • Mulching through weeds & residue • Spraying of micronutrient 	

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

	Up land Medium to low deep soil Sandy loam to clay loam soil.	1.Maize- Fallow 2.Pigeonpea - Fallow Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Pigeonpea: NDA-1, NDA-2, Bahar, Malviya-9	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching • Thinning • Clipping of leaves in maize 	<ul style="list-style-type: none"> • Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like Gram, Lentil, Linseed. • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage 	Seeds from BRBN, RAU, Pusa, NSC, TDC
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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)					
	Medium land	1.Rice- Wheat 2.Rice- Maize Medium duration Rice Rice – Pusa 2-21, Rajendra Suwasini Prabhat , Sita safed Wheat - HD-2733, PBW-343, HP-1731 Maize	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching • Thinning • Clipping of leaves in maize 	<ul style="list-style-type: none"> • Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Gram/ Lentil /Mustard/ Linseed • Stored water to be used at critical stage of growth 	

		Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3		<ul style="list-style-type: none"> • To clean irrigation channel for preventing loss of moisture through seepage 	
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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)					
	Low land	1.Rice- Wheat 2.Rice- Maize- Green gram Rice- Sita safed Rajendra Suwasini, Rajendra Sweta Rajendra Mansoori-1 Wheat- HD-2733, PBW-343, PBW-502, HP-1731 Maize Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Makka-3 Greengram Pusa Bashakhi, SML 668, PDM-54	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching • Thinning • Clipping of leaves in maize 	<ul style="list-style-type: none"> • Open the furrow during evening and left furrow open overnight and plank in the next morning before sunrise for growing of early rabi crops like wheat, Rabi Maize/Gram/ Lentil /Mustard/ Linseed • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage 	

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	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize	1.Mustard- Greengram 2.Maize- Potato 3.Maize- Lentil Mustard- 66-197-3, Rajendra Sarson-I Lentil- PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3 Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	<ul style="list-style-type: none"> • Spray of Potassic fertilizer • Life saving irrigation • Use of mulches • Spray of micronutrient 	Seeds from BRBN, RAU, Pusa, NSC, TDC

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	Upland	1.Rice- Wheat- Green gram 2.Rice- Potato- Summer vegetable 3.Rice- Maize- Green gram	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize Rice- Prabhat, Dhanlaxmi, Richarria, Saroj Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok, Pusa early hybrid Macca-3 Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	<ul style="list-style-type: none"> • Spray of Potassic fertilizer • Life saving irrigation • Use of mulches • Spray of micronutrient 	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Low land	1.Rice- Wheat- Green gram 2.Rice- Potato 3.Rice- Onion	1.Rice- Wheat- 2.Rice- Lentil/ Linseed 3.Rice- Chickpea Rice- Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya Linseed- Shubra, Garima, Sweta Lentil- PL-406, Malika, Arun Chickpea- Pusa-236, KPG-	<ul style="list-style-type: none"> • Spray of Potassic fertilizer • Life saving irrigation • Use of mulches • Spray of micronutrient 	

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
			39 (Uday) , Pusa-372, SG-2		
Non release of water in canals under delayed onset of monsoon in catchment	Upland	1.Rice- Wheat- Green gram 2.Rice- Potato- Summer vegetable 3.Rice- Maize- Green gram	1.Rice- Wheat 2.Rice- Potato 3.Rice- Maize Rice- Prabhat, Dhanlaxmi, Richarria, Saroj Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deok Pusa early hybrid Macca-3 Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti	<ul style="list-style-type: none"> • Spray of Potassic fertilizer • Life saving irrigation • Direct seeding of rice • Use of mulches • Spray of micronutrient 	Seeds from BRBN, RAU, Pusa, NSC, TDC
	Low land	1.Rice- Wheat- Green gram 2.Rice- Potato 3.Rice- Onion	1.Rice- Wheat- 2.Rice- Lentil/ Linseed 3.Rice- Chickpea Rice: Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya Linseed- Shubra, Garima,	<ul style="list-style-type: none"> • Spray of Potassic fertilizer • Life saving irrigation • Direct seeding of rice • Use of mulches 	

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			Sweta Lentil- PL-406, Malika, Arun Chickpea - Pusa-236, KPG-39 (Uday) , Pusa-372, SG-2	<ul style="list-style-type: none"> Spray of micronutrient 	

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

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"> Gap filling Removal of excess 	<ul style="list-style-type: none"> Drainage management 	<ul style="list-style-type: none"> Drainage management Subsequent crop if 	Storage at safer place

	water	<ul style="list-style-type: none"> • Sowing of subsequently crop, if totally damaged i.e. Toria 	<ul style="list-style-type: none"> • totally damaged • Harvest at physiological maturity 	
Maize	<ul style="list-style-type: none"> • Gap filling • Removal of excess water • Re sowing, if completely damaged 	<ul style="list-style-type: none"> • Drainage management • Sowing of alternative maize or other rabi crop if totally damaged 	<ul style="list-style-type: none"> • Drainage management • Subsequent if totally damaged • Harvest at physiological maturity 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • September sowing of Pigeonpea(var. harad), if, previous Pigeonpea crop is completely damaged • Gap filling, if needed • Removal of excess water 	<ul style="list-style-type: none"> • Drainage management • Sowing of alternative rabi maize or other crops like chilly\ tomato\ brinjal if totally damaged 	<ul style="list-style-type: none"> • Drainage management • Subsequent if totally damaged • Harvest at physiological maturity 	Storage at safer place
Horticulture				
Mango	<ul style="list-style-type: none"> • Strengthening of Drainage system • Replanting of crop if substantially damaged 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Drenching with copper fungicides 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Harvesting at proper time 	Immediate sale of fruits and safe transportation
Condition	Suggested contingency measure			
Heavy rainfall with high speed winds in a short span	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Rice	<ul style="list-style-type: none"> • Gap filling • Removal of excess water 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Sowing of subsequently crop, if 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Subsequent crop if totally damaged 	Storage at safer place

		totally damaged i.e. Toria	<ul style="list-style-type: none"> • Harvest at physiological maturity 	
Maize	<ul style="list-style-type: none"> • Gap filling • Removal of excess water • Re sowing, if completely damaged 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Sowing of alternative maize or other rabi crop if totally damaged 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Subsequent if totally damaged • Harvest at physiological maturity 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • September sowing of Pigeonpea (var. Sharad), if, previous red gram crop is completely damaged • Gap filling, if needed • Removal of excess water 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Sowing of alternative rabi maize or other crops like chilly\ tomato\ brinjal if totally damaged 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Subsequent if totally damaged • Harvest at physiological maturity 	Storage at safer place
Horticulture				
Mango	<ul style="list-style-type: none"> • Strengthening of Drainage system • Replanting of crop if substantially damaged 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Drenching with copper fungicides 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Harvesting at proper time 	Immediate sale of fruits and safe transportation

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Outbreak of pests and diseases due to unseasonal rains				
Rice	<ul style="list-style-type: none"> • Removal of excess water • Seedling treatment 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of 	Storage at safer place

	<ul style="list-style-type: none"> with Carbendazim + Emidachloprid • Implementation of IPM practices • Spray of pesticides with adjuvant 	<ul style="list-style-type: none"> IPM practices • Spray of specific pesticides with adjuvant 	<ul style="list-style-type: none"> IPM practices • Spray of specific pesticides with adjuvant 	
Maize	<ul style="list-style-type: none"> • Soil application of granular insecticides viz. Phorate 10 g/Carbofuran 3g in whorl of maize • Implementation of IPM practices • Spray of pesticides with adjuvant 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of IPM practices • Spray of specific pesticides with adjuvant 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of IPM practices • Spray of specific pesticides with adjuvant 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • Implementation of IPM practices • Spray of pesticides with adjuvant 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of IPM practices • Spray of specific pesticides with adjuvant 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of IPM practices • Spray of specific pesticides with adjuvant 	Storage at safer place

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Outbreak of pests and diseases due to un-seasonal rains				
Horticulture				
Mango	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of 	<ul style="list-style-type: none"> • Strengthening of Drainage system • Implementation of 	Immediate sale of fruits and safe transportation

	IPM practices • Spray of specific pesticides with adjuvant	IPM practices • Spray of specific pesticides with adjuvant	IPM practices • Spray of specific pesticides with adjuvant	
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2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Crop1	Not Applicable			
Horticulture				
Crop1				
Continuous submergence for more than 2 days				
Crop1				
Horticulture				
Crop1				
Sea water intrusion³				
Crop1				

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				
Rice	• Life saving irrigation	• Life saving irrigation • Spray of potassic fertilizer with adjuvant	• Life saving irrigation • Spray of potassic fertilizer with adjuvant	
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				
Wheat		• Light irrigation • Mulching by crop residue \ weed		
Maize		• Light irrigation • Mulching by crop residue \ weed		
Mustard		• Light irrigation • Mulching by crop residue \ weed		
Potato		• Light irrigation • Mulching by crop residue \ weed		
Pulses		• Light irrigation • Mulching by crop residue \ weed		

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Horticulture				
Brinjal		• Light irrigation • Mulching by crop residue \ weed		

Chilli		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Tomato		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Bhendi		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Frost				
Wheat		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Maize		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Mustard		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Potato		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Pulses		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		

Horticulture				
Brinjal		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Chilly		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Tomato		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Bhindi		<ul style="list-style-type: none"> • Light irrigation • Mulching by crop residue \ weed 		
Hailstorm	Not Applicable			
Crop1				
Horticulture				
Crop1				

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Cyclone	Not Applicable			
Crop1				
Horticulture				
Crop1 (specify)				

Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and Fodder availability	<p>1. Reserve feed/ fodder bank at community level</p> <p>Each district should have reserves (feeding 5000 ACU maintenance ration for about 1-3 weeks period) of the following at any point of the year for mobilization to the needy areas. Checking of feed availability may be made at 3 months interval, particularly before onset of summer.</p> <p>Silage:20-50 t</p> <p>Urea molasses mineral bricks (UMMB): and complete feed block (CFB) 50-100 t</p> <p>Hay:100-250 t</p> <p>Concentrates: 20-50 t</p> <p>Minerals and vitamin supplements mixture:1-5 t</p> <p>2. Preparation and storage of silage</p>	<p>Harvest and use all the failed crop (Maize, Rice, Wheat, Horse gram etc) material as fodder.</p> <p>Harvest the top fodder (Neem, Subabul, Acasia, Pipol, Gular, Sessame, Bamboo etc) and unconventional feeds resources like banana plants, babool pods etc for use as fodder for livestock (LS).</p> <p>Sugarcane tops or whole sugarcane plant may be fed to livestock.</p> <p>Aquatic plants like lotus, water hyacinth, duckweed may be fed to livestock mixing with straw.</p> <p>During drought, sorghum may accumulate HCN, which is toxic to livestock. Care may be taken in feeding of stunted grown Sorghum fodder.</p> <p>Available feed and fodder should be collected from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>Mild drought : hay should be transported to the</p>	<p>Short duration fodder crops of Sorghum / Bajra / Maize (UP Chari, Pusa Chari, HC-136, HD-2/Rajkoo, Gaint Bajra, L-74, K-6677, Ananand / African tall, Kissan composite, Moti, Manjari, BI-7) and cowpea should be sown in unsown and crop failed areas. Cultivation of fodder Rabi maize if water stagnated upto Nov/ December. Cultivation of Jowar/CowpeaMaize in September.</p> <p>Rapeseed, mustard, Chinese cabbage etc and maize may be grown as fodder where feasible. These crops will be harvested in November to facilitate the sowing of wheat,</p>

<p>and hay at household level</p> <p>Preserve the fodder in the form of hay from Berseem, cowpea, oat & other grasses as well as silage from</p> <p>(a) Maize- harvesting at dough stage. (b) Sorghum - at flowering stage. (c) Oat (d) Hybrid Napier – 40-45 day old. (e) Water hyacinth mixing with Paddy straw in ratio of 4:1 with 70 kg molasses /ton of clean water hyacinth.</p> <p>Bales of hay and other dry fodder should be stored and covered with asbestos sheet or polythene sheet.</p> <p>3, Creation of permanent fodder seed banks in all drought prone areas.</p> <p>2. Establishment of silvi-pastoral system and cultivation of fodder tress</p> <p>Establishment of silvi-pastoral system in CPRs with <i>Stylosanthus hamata</i> and <i>Cenchrus ciliaris</i> as grass with <i>Leucaena leucocephala</i> as tree component. Fodder trees may be planted around the house, wasteland</p>	<p>needy areas</p> <p>Moderate drought: hay, silage and vitamin & minerals mixture should be transported to the needy areas</p> <p>Severe drought: UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas. All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS. In acute drought affected areas, animal camp may be organized along nearby canals or water sources. Farmers along with canal may be persuaded to cultivate fodder crops.</p> <p>Herd should be split and supplementation should be given only to the highly productive and breeding animals (pregnant animals). Due to prolonged under-feeding, there is a chance of abortion in pregnant animals and lactating cows may show the symptoms of hypoglycemia. Comparatively good quality feed may be offered to milch and pregnant animals. Dry and non-productive animals may be reared on dry roughages sprayed with 10% molasses or crude jaggery solution and 2% urea for maintenance of animals.</p> <p>Available kitchen waste should be mixed with dry</p>	<p>pulses etc. Under irrigated conditions sowing of barseem with Chinese cabbage in last week of September may be taken up for early availability of green fodder. Oats may be grown in October as multi cut fodder to ensure the fodder availability for longer period.</p> <p>Concentrates supplementation should be provided to all the animals.</p>
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<p>etc. Recently, Chaya tree (<i>Cnidoacolus aconitifolius</i>) has been introduced in IGFRI, Jhansi which has high protein value, may be introduced in drought prone regions.</p> <p>3. Management of CPRs</p> <p>Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in CPRs with the monsoon pattern for higher biomass production</p> <p>4. Short duration and low water requiring fodder cultivation</p> <p>Increase area under short duration fodder crops of sorghum/bajra/maize (UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti) and cowpea.</p> <p>5. Feeding management</p> <p>Chopping of fodder should be made as mandatory in every village through supply and establishment of good quality crop cutters.</p> <p>Establishment of backyard production of Azolla for feeding dairy animals.</p> <p>Establishment of back yard cultivation of para grass/ hybrid</p>	<p>fodder while feeding.</p> <p>Livestock should be kept in shelter or under shed during daytime. In case of hot weather condition, grazing may be done in morning and afternoon. Livestock should not be traveled long distance for grazing to save energy and drinking water intake. Animals should not be watered immediately after return from grazing.</p> <p>Washing of animals may be done at least twice a day.</p> <p>40-50 g of salt and 30-40 g mineral mixture per adult animal and 10-20 g for small ruminants and calves to be provided daily through feed to reduce the imbalances of minerals.</p> <p>Livestock may be provided with drinking water from wells, hand pumps or from pond. In case of bad water quality, bleaching powder or chlorine or lime may be applied to water.</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for the culled and unproductive animals (10000-</p>	
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	<p>Napier with drain water from bath room/washing area</p> <p>Avoid feed wastage by offering chaffed fodder and less quantity feed for 4 times a day.</p> <p>Avoid burning of wheat straw and maize stover. The big farmers may allow smallholders to collect residual straw after using combine harvester.</p> <p>Harvesting and collection of perennial vegetation particularly grasses which grow during monsoon. If excess grasses are collected, dried grass may be stored.</p> <p>Proper drying, baling and densification of harvested grass.</p>	<p>20000 animals)</p> <p>Subsidized loans (5-10 crores) should be provided to the livestock keepers.</p>	
Cyclone	<p>Harvest all the possible wetted grain (rice/ wheat/maize etc) and use as animal feed after drying.</p> <p>Arrange for storing minimum required quantity of hay (25-50 kg) and concentrates (10-25 kg) per animal in farmer's / LS keepers house/ shed for feeding during cyclone.</p> <p>Don't allow the animals for grazing in case of early fore warning (EFW)</p> <p>Incase of EFW, shift the animals to</p>	<p>Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Diarrhea out break may happen, arrangement should be made to mitigate the problem</p> <p>Protect the animals from heavy rains and thunder storms</p> <p>In severe cases un-tether or let loose the animals</p> <p>Arrange transportation of highly productive animals to safer place</p>	<p>Repair of animal shed</p> <p>Deworm the animals through mass camps</p> <p>Vaccinate against possible out breaks</p> <p>Proper disposable of the dead animals / carcasses by burning / burying with lime/ bleaching powder in pit</p> <p>Bleach / chlorinate (0.1%) drinking water or water</p>

	<p>safer places.</p> <p>Identification of animals may be done.</p> <p>Keep animals untied in the shed in case of EFW.</p>	<p>Spraying of fly repellants in animal sheds</p>	<p>resources</p> <p>Collect drowned crop material, dry it and store for future use</p> <p>Sowing of above mention short duration fodder crops in unsown and water logged areas</p> <p>Application of urea (20-25kg/ha) in the CPR's to enhance the bio mass production.</p>
Floods	Not Applicable		
Heat & Cold wave	<p>Arrangement for protection from heat wave</p> <p>i) Plantation around the shed</p> <p>ii) Water sprinklers / foggers in the shed ot frequent washing of animals.</p> <p>iii) Application of white reflector paint on the roof or putting rice straw on the roof of the shed.</p> <p>Cold wave : Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day</p>	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves. Molasses may be added in the concentrate feed during heat waves.</p> <p>Put on the foggers / sprinklers and frequent washing of animals during heat waves and heaters during cold waves</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>

	time and putting down during night time)	In severe cases, vitamin 'C' and electrolytes should be added in H ₂ O during heat waves. Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	
Health and Disease management	Specify the endemic diseases (species wise) in that region. Identification of veterinary staff and animal health workers. Constitution of Rapid Action Veterinary Force Storage of emergency medicines and medical kits Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Surveillance and disease monitoring network establishment Provision for mobile ambulatory van.	Rescue of sick and injured animals and their treatment Conducting mass animal health camps Animals may be checked for any external injury and illness, Pregnant animals may be checked for any discomfort and uneasiness. Animals may be dewormed with suitable anti-parasitic drug and be checked and treated for ecto-parasites, if any. Deworming will improve fodder and feed absorption. During flood do not leave halter or headstalls on animals. Do not tie animals together when releasing. Report the location, identification and disposition of livestock and poultry to authorities handling the disaster. During flood cases of malaria, diarrhea,	Conducting psahu sibir, mass animal health camps, fertility camps and deworming camps. Conducting fertility camps. Disposal of carcass by above means. Pregnancy toxemia may occur due to prolonged under-feeding. Hypoglycemia is also observed. Treatment may be provided to affected animals. 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. During flood cases of malaria, diarrhea, respiratory infection, fever, injury, leg gangrene, water born

		<p>respiratory infection, fever, injury, leg gangrene and snake bite may be high. Precaution may be taken to treat the affected animals.</p>	<p>diseases and snake bite may be high. Precaution may be taken to treat the affected animals</p> <p>Diseases that can occur during flood should be given special attention and accordingly medicines should be made 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</p>
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			Brooders pneumonia Malaria Snake bite.
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals) Identification of water resources	Restrict wallowing of animals in water bodies/resources	Specify the options (place and area) for establishment of drinking water reserves

Vaccination schedule in small ruminants (Sheep & Goat)

Disease	Season
Foot and mouth disease (FMD)	Before rainy season and in winter / autumn
PPR	All seasons, preferably in June-July
Black quarter (BQ)	May / June
Enterotoxaemia (ET)	May
Haemorrhagic septicaemia (HS)	March / June

Sheep pox (SP)	December / March
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Vaccination programme for cattle and buffalo:

Disease	Age and season at vaccination
Anthrax	In endemic areas only, Feb to May
HS	May to June
BQ	May to June
FMD	November to December

2.5.2 Poultry

	Suggested contingency measures		
	Before the event^a	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, wheat etc, Culling of weak birds	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds	Supplementation to all
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination	Mixing of Vit. A,D,E, K and B-complex including vit C in	Hygienic and sanitation of poultry house

	against RD and fowl pox	drinking water	Disposal of dead birds by burning / burying with lime powder in pit
Floods	Not Applicable		
Cyclone			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed
Drinking water	Provide clean drinking water	Sanitation of drinking water	Sanitation of drinking water
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder to prevent ammonia	Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD

		accumulation due to dampness	
Heat wave and cold wave			
Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed. Increase energy and vitamin concentration in feed (supplementation with grain).	Routine practices are followed
Cold wave			

Shelter/environment management	Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Arrangement for protection from chilled air	Supplementation of grains Antibiotics in drinking water to protect birds from pneumonia	Routine practices are followed

^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	
1) Drought	Not Applicable			
	Suggested contingency measures			Convergence/ linkages with ongoing programs, if any

	Before the event^a	During the event	After the event	
2) Floods	Not Applicable			

	Suggested contingency measures			Convergence/ linkages with ongoing programs, if any
	Before the event^a	During the event	After the event	
3. Cyclone / Tsunami				

	Suggested contingency measures			Convergence/ linkages with ongoing programs, if any
	Before the event^a	During the event	After the event	
4. Heat wave and cold wave				

^a based on forewarning wherever available