

State: BIHAR

Agriculture Contingency Plan for District: SAHARSA

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Eastern Plains (15)		
	Agro-Climatic Zone (Planning Commission)	Middle Gangetic Plain (IV)		
	Agro Climatic Zone (NARP)	North East Alluvial Zone (II)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Saharsa, Madhepura, Supaul, Araria, Katihar, Purnea, Kisanganj and Khagaria,		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		25 ^o 52'' 55' N	27 ^o 48'' 56' E	44m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Station (RRS), Agwanpur, Saharsa P.O – SISAI PIN 852201 Phone/Fax : 06478-281061		
	Mention the KVK located in the district with address	KVK, Agwanpur , Saharsa PIN : 852201		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Mandan Bharti Agriculture College, Agwanpur, Saharsa P.O – SISAI Dist : Saharsa PIN - 852201			

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)	1082.6	Not Available (NA)	3 rd Week of June	3 rd Week of October
	NE Monsoon(Oct-Dec)	86.1	-	-	-
	Winter (Jan- March)	51.5	--	-	-
	Summer (Apr-May)	105.6	-	-	-

	Annual	1325.8				65		-		-	
1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	164.559	107.143	0.171	-	1.167	0.479	4.273	11	-	11.13

Ssource;C-DAP,Saharsa

1.4	Major Soils (common names like red sandy loam deep soils (etc.))*	Area ('000 ha)	Percent (%) of total	Remarks
	Loam to Silt loam	52.884	32.1	Plain Upland
	Loam to loamy clay	45.393	27.6	Deep water and waterlogged area
	Clay loam, Loam to Silt loam	25.320	15.4	Mid upland to low land
	Sandy, Sandy clay & Sandy loam	41.014	24.9	Area within the Kosi Embankments

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	107.143	177%
	Area sown more than once	82.935	
	Gross cropped area	190.078	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	55.318		
	Gross irrigated area	76.000		
	Rainfed area	52.825		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	-	10.177	18.4
	Tanks	855	1.637	2.9
	Open wells	-	1.269	2.3

Bore wells	-	17.157	31.0
Lift irrigation schemes	-	02.948	5.4
Micro-irrigation	-	-	-
Other sources (please specify)	1200	22.130	40.0
Total Irrigated Area	-	55.318	100
Pump sets	-	-	-
No. of Tractors	-	-	-
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	All blocks	-	-
Wastewater availability and use	-	-	-
Ground water quality	05 Tehsils		Excess Iron (upto 10ppm)
*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	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice	-	-	27.940	-	-	-	-	27.940	
Maize	-	-	0.941	7.0	-	7.0	-	7.941	
Wheat	0	0	0	49.69	-	49.69	-	49.690	
Lentil/Pulses	0	0	0	-	-	1.427	-	1.427	

	Mustard	0	0	0	1.682	-	1.682	-	1.682
	Greengram	-	-	-	-	-	-	1.058	1.058

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	2.581	-	-
	Guava	0.292	-	-
	Banana	0.277	-	-
	Litchi	0.357	-	-
	Makhana	0.800	-	-
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Potato	6.200	-	-
	Cabbage	0.992	-	-
	Onion	0.280	-	-
	Tomato	0.137	-	-
	Bhendi	0.226	-	-
	Cucurbits	1.35	-	-
	Medicinal and Aromatic crops	Total	Irrigated	Rainfed

	Mentha	0.020	-	-
	Plantation crops	Total	Irrigated	Rainfed
	Fodder crops	Total	Irrigated	Rainfed
	Sorghum + Meth	0.150	-	-
	Total fodder crop area	-	-	-
	Grazing land	-	-	-
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	110.602	137.144	247.746
	Improved cattle	-	-	-
	Crossbred cattle	3.030	8.661	11.691
	Non descriptive Buffaloes (local low yielding)	23.599	103.256	126.855
	Descript Buffaloes	-	-	-
	Goat	89.027	185.994	275.021
	Sheep	0.143	0.171	0.314
	Others (Camel, Pig, Yak etc.)	-	-	-
	Commercial dairy farms (Number)			.038
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	41	18.470	
	Backyard	1120	141.437	
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. of Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	860		941		81	
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)			1057.13	3.2/ha	1552.11	
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)										
	Rice	47.008	1685	-	-	-	-	47.008	1685	42.00
	Wheat	-	-	108.082	2190	-	-	108.082	2190	98.50
	Maize (Rabi)	-	-	19.095	2512	-	-	19.095	2512	5.5
	Maize (Kharif)	0.837	889	-	-	-	-	0.837	809	0.1

	Lentil	-	-	0.863	605	00	00	0.863	605	1.2
	Greengram	-	-			0.751	710	0.751	710	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango	-	-	-	-	-	-	23.024	90000	-
	Potato	-	-	-	-	-	-	903.00	14500	-
	Onion	-	-	-	-	-	-	6.030	20200	-

SOURCE: DAO, SAHARSA-

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

1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes (Tabular Form)

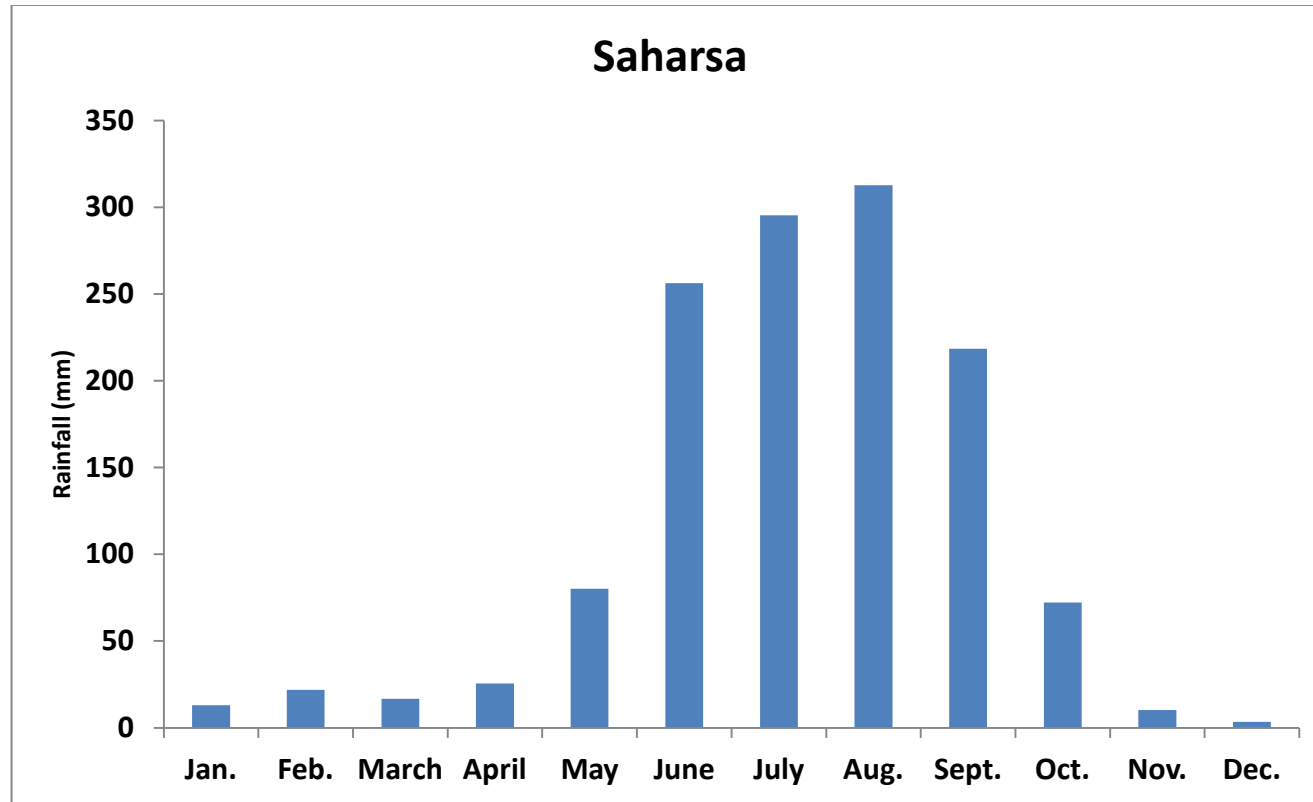
Annexure I

Agro climatic Zones of Bihar

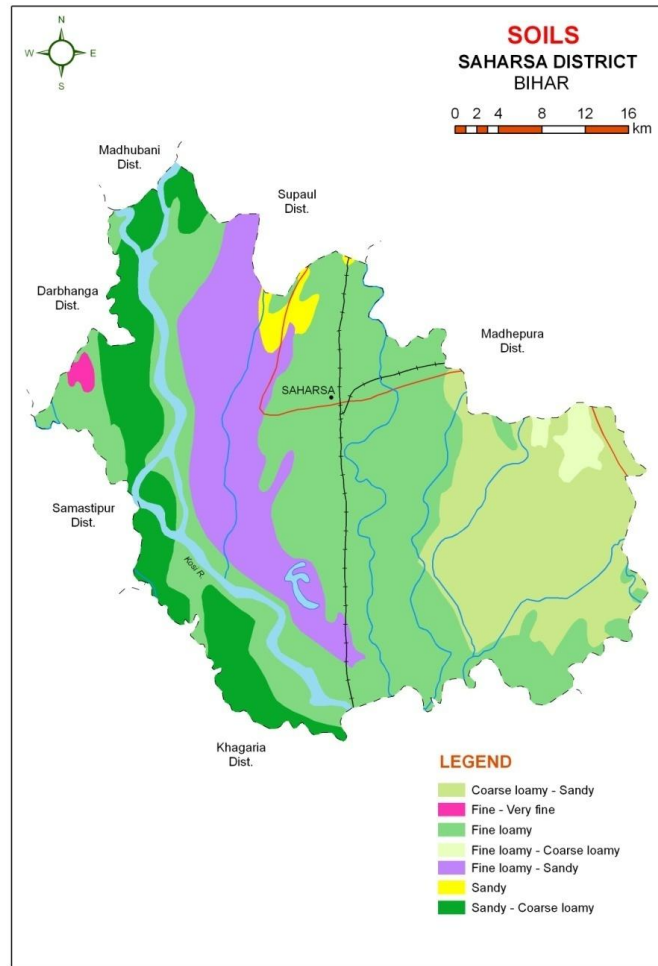


Source: krishi.bih.nic.in

Annexure-II



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 ^c including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 1 st week of July	Up land Sandy loam to loam, Deep Soil	Rice-Wheat	Rice – Wheat - Prabhat, Dhanlaxmi, Richharia, Turanta,	<ul style="list-style-type: none"> Normal package of Practices 	<ol style="list-style-type: none"> Seeds from RAU, Pusa, NSC, TDC, BRBN etc. Seed drills under RKVY Supply of seeds through NFSM
	Medium land Clay loam to loam, deep soil	Rice- Wheat	Rice-Wheat Medium duration Rice	<ul style="list-style-type: none"> Normal package of Practices 	
	3. Low land Clay loam to loamy clay soil	Rice (Deep Water)– Fallow – Summer(Greengram + Sorghum) Rice (Deep Water) – Local Desaria, Kashan Greengram – Pusa Baisakhi Makhana (in ponds) Var. local	Rice – Fallow –Summer (Greengram + Sorghum) Medium to long duration Rice be selected	<ul style="list-style-type: none"> Normal package of Practices Old age rice seedlings may be used with 3-4 seedlings/hill with close spacing 	

	4. Low Land (Submerged)	Deep Water Rice – Boro Rice Rice(Deep Water) – Desaria, Kashan Rice (Boro) – Sita, Local	Deep water Rice – Boro Rice Deep Water Rice - Vaidehi, Swarna Sub 1 Rice (Boro) – Gautam, Saroj		
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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)	Upland Sandy loam to loam, deep soil	Rice- Wheat Pigeonpea – Greengram Rice- Maize Greengram - Pusa Bashaki, SML668, PDM- 54, T-44 Rice- Jaya, R. Mahsuri 11, Dhanlaxmi, Rajendra Bhagwati, Saroj Wheat- PBW 373, UP 262 Pigeon pea – Bahar, Pusa 9	Short duration Rice-Wheat (Timely sown) Short duration Rice –Rabi Maize Rice- Prabhat, Dhanlaxmi, MTU 1010, Richharia, , Saroj, Saryu 52 Wheat- HD 2733, PBW 343, K 307, K 9107 Rabi Maize - Hybrid	<ul style="list-style-type: none"> ▪ Old age 30-35 d seedlings of early rice variety may also be used ▪ 20 days Dapog seedling can be used in rice ▪ Direct seeding of rice ▪ SRI technique 	<ol style="list-style-type: none"> 1. Seeds from RAU, Pusa, NSC, TDC, BRBN etc. 2. Seed drills under RKVY 3. Supply of seeds through NFSM
		Medium land Clay loam to loam, deep soil	Rice – Wheat Rice - Rajendra Bhagawati, Rajendra Suwasni Rajshree, Prabhat	Rice-Wheat Rice – Rabi Maize Mid duration Rice up to 125-130 days Rice -	<ul style="list-style-type: none"> • Full basal dose of NPK • Life saving irrigation • Application of Potash at PI stage

		Wheat- HD 2733, PBW 343, HP 1731	Rajendra Suwasni , Rajshree, Maize – Shaktiman 3, Shaktiman 4		
	Low land	Rice – Wheat – Summer (Greengram) Rice- Rajshree, Rajendra Suwasni, Rajendra Mahsuri 1 Rice(Deep Water) –Boro Rice Makhana (in ponds) Var. local Rice (Deep Water) – Vaidehi, Desaria, Kashan Boro Rice – Local	Rice - Late Wheat –Summer (Greengram) Rice – Rajendra Mahsuri 1, MTU1001 Wheat (Late Sown) – PBW 373, HD 2643, DBW 14 Deep water Rice – fallow – summer (Greengram + Sorghum) Rice(Deep water)- Swarna Sub 1, Greengram – SML 668, Samrat, Meha Boro Rice – Gautam, Saroj	<ul style="list-style-type: none"> • Direct seeding of deep water rice • Even low land rice can be direct seeded • Brown manuring in low land rice 	

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	Sandy loam to loam, deep soil	Rice-Wheat	Early Rice – Wheat / Satawar- Wheat- Greengram	<ul style="list-style-type: none"> • Direct sowing of rice • Dapog seedling can 	1. Seeds from RAU, Pusa, NSC,

1 st week of August		<p>Rice- Prabhat, Dhanlaxmi, Richharia, Turanta Saroj</p> <p>Wheat- HD-2733, PBW-343, HP-1731</p>	<p>/</p> <p>Ashwagandha – Wheat – Greengram/</p> <p>Blackgram/ Finger Millet - Wheat</p> <p>Blackgram - T 9, Navin, Pant Urd 30 , Pant Urd 19</p> <p>Finger Millet - DB 7, BR 5, BR 10, Coimbatore 1</p> <p>Wheat- HD 2733, PBW 343, K 307, K 9107, HD 2824</p> <p>Rice- Prabhat, Dhanlaxmi, Richharia, Turanta Saroj, MTU 1010</p> <p>Greengram – Pusa Vishal, Meha, PDM 54</p>	<p>be used</p> <ul style="list-style-type: none"> • Application of Potasic fertilizer with adjuvant vegetative stage • Zero tillage for rice & wheat to makeup the time • Protective spray of pesticides with adjuvant against BLB & BLAST& Helminthosporium leaf spot. • Transplanting of old age seedling of 30-35 days 	<p>TDC, BRBN etc.</p> <p>2. Seed drills under RKVY</p> <p>3. Supply of Rice drum seeder under RKVY</p> <p>4. Supply of seeds of Medicinal crops through NHM</p>
	<p>2. Medium land</p> <p>Clay loam to loam, deep soil</p>	<p>Rice – Wheat</p> <p>Rice Rabi - Maize</p> <p>Rice - Rajendra Bhagawati, Rajendra Suwasni Rajshree, Prabhat</p> <p>Wheat- PBW 343, HP 1731, UP 262</p> <p>Maize - Hybrids</p>	<p>Rice (Short duration)- Wheat</p> <p>Blackgram/ Finger Millet- Wheat</p> <p>Rice Rabi - Maize</p> <p>Blackgram- T-9, Navin, Pant Urd-30 , Pant Urd-19</p> <p>Finger Millet- DB-7, BR-5, BR-10, Coimbatore-1</p> <p>Wheat- HD-2733, PBW-343, HP-1731, K 307, HD 2824</p>	<ul style="list-style-type: none"> • Enhanced basal dose of NPK to boost the early vegetative growth • Application of Potasic fertilizer with adjuvant • Direct seedling of rice • Use of 20 days old dapog seedling for rice 	<p>1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc.</p> <p>2. Supply of zero till seed drill through RKVY</p>

			Maize(Hybrid) – Shaktiman 3 Shaktiman 4 Or other prevalent hybrids	<ul style="list-style-type: none"> Protective spray of pesticides with adjuvant against BLB, BLAST & Helminthosporium leaf spot. 	
3. Low land	Loamy Clay, Deep Soil	Rice (Deep Water)-Fallow-Green Gram Rice (Deep Water)-Boro Rice Deep water Rice – Swarna Sub 1, Vaidehi, Local Green Gram – P. Baisakhi, T 44	Rice –Vegetable/Pea - Green Gram Rice- Berseem (fodder)- Green Gram Rice – Fallow – Greengram + Sesame Rice- Rajshree, Sita, Rajendra Suwasni, MTU 1001 Rice (Deep Water)- Boro Rice Wheat - HD-2733, PBW-343, K 307 HP-1731, HD-2824 Sesame-Krishna Pragati Green Gram – Pusa Vishal, SML 668, Meha Deep water Rice – Swarna Sub 1, Vaidehi Boro Rice – Gautam, RajendraBhagwati, Saroj	<ul style="list-style-type: none"> Used for rice Direct sown rice in low land with basal NPK Protective spray of pesticides Enhanced basal dose of NPK Brown manuring in rice 	1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Supply of zero till seed drill for Rice through RKVY

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

onset)					
Delay by 8 weeks 3 rd week of August	Upland Sandy loam to loam, deep soil	Rice-Wheat Wheat – PBW 343, UP 262, HP 1731 Rice – Jaya, Saryu 52 Greengram – P. Baisakhi, T44	Early Rice – Late Wheat Early Rice - Vegetable/ Pea Early Rice – Lentil Rabi Pigeonpea (Sept. sown) – Greengram Toria(Rabi) – Potato – Summer Greengram Early Tomato – Summer Greengram Rice- Prabha, Dhanlaxmi,MTU 1010 Late Wheat – PBW-373, DBW-14, HP-1744, HD- 2643 Greengram – Samrat, Pusa Vishal, SML 668, PDM-54, T-44 Sept. Pigeonpea –Pusa-9 Sharad Potato – K. Ashoka, K. Anand. K Pukhraj Blackgram - T-9, Navin, Pant Urd-30 , Pant,	<ul style="list-style-type: none"> • Use of 20 days old Dapog seedling in Rice • Direct seeding of rice • Application of organic manure and vermicompost initially for rice and other crops • SRI technique in rice/hybrid rice • Use of Polyhouse/Polytunne I raised cucurbits/ tomato seedling 	1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Supply of zero till seed drill for Rice and wheat through RKVY

			Urd-19 Early Tomato – Pusa Ruby, Pusa Rupali, Pusa Gaurav Torja – RAUT’s 17, Bhawani		
2) Medium land Clay loam to loam, deep soil	Maize-Wheat Rice-Wheat Wheat – PBW 343, HP 1744, UP 262 Early Rice- Prabhat, Dhanlaxmi, Richharia, MTU 1010	Sesame –Rabi maize Sesame-Late Wheat Sesame – Krishna, Pragati Rabi Maize- Saktiman- 1,2,3,4, Laxmi, Deoki, Rajendra Hybrid- 1,2 Late Wheat – PBW 373, DBW-14, HP-1744, HD-2643, Raj 3765	<ul style="list-style-type: none"> • Zero tillage for wheat to make up the time • Application of organic manure and vermicompost initially for rice and other crops 	1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Supply of cono weeder and marker for SRI through RKVY	
	Pigeonpea –Greengram	Sept. Pigeonpea-Greengram Greengram – Samrat, Pusa Vishal, SML 668, PDM-44, T-44 Sept.Pigeonpea–Pusa-9, Sharad Narendra Arhar-I	<ul style="list-style-type: none"> • Application of organic manure and vermicompost initially for rice and other crops 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc	

<p>Low land (Submerged)</p> <p>Loamy Clay, Deep Soil</p>	<p>Rice(Deep Water)- Fallow – Greengram</p> <p>Rice (Deep Water) – Local (Desaria & Kashan)</p> <p>Greengram – P. Baisakhi, Meha, P. Vishal</p>	<p>Rice (Deep Water)- Boro Rice</p> <p>Rice – Fallow – Greengram + Sorghum</p> <p>Rice – Fallow – Greengram + Napier</p> <p>Boro Rice – Gautam, Rajendra Bhagwati, Saroj</p> <p>Deep Water Rice – Swarna Sub 1</p>	<ul style="list-style-type: none"> • Application of organic manure and vermicompost initially for rice and other crops • Direct seeding of rice in dry soil in anticipation of rain • Brown manuring in rice 	<ol style="list-style-type: none"> 1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Supply of Rice seed drill through RKVY 3. Supply of seeds for brown manuring through NFSM
<p>Low land</p> <p>Sandy clay, deep soil</p>	<p>Rice – Wheat – Greengram</p> <p>Rice – Potato - Greengram</p>	<p>Sept. Pigeonpea – Greengram + Napier</p> <p>Sesame-Rabi maize</p> <p>Rice – Late Wheat</p> <p>Late Wheat- PBW 373, DBW 14, HD 2643</p> <p>Rice- Rajshree, MTU1001 Rajendra Suwasni, Rajendra Mahsuri 1</p> <p>Rice – Potato - Greengram + Sorghum</p> <p>Potato – PJ376, Rajendra Aloo- 1,2,3, Kufri Jyoti</p> <p>Rice – Potato- Sesame</p> <p>Greengram – Samrat, Pusa Vishal, SML 668,</p> <p>Sesame – Krishna, Pragati</p>	<ul style="list-style-type: none"> • Brown manuring in rice • Protective spray of pesticide with adjustments in rice • Use of Dapog rice seedling 	<p>Seeds from RAU, Pusa, NSC, TDC , BRBN etc</p>

Condition	Major Farming situation ^a	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)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Sandy loam to loam, deep soil	<p>Rice-Wheat</p> <p>Rice – Rabi Maize</p> <p>Rice- Prabhat, Dhanlaxmi, Richharia, Turanta, Saroj</p> <p>Wheat- HD-2733, PBW 343, HP-1731, HD-2824</p> <p>Maize – Hybrid</p>	<ul style="list-style-type: none"> • Life saving irrigation • Gap filling of existing rice crop by extra seedlings of simultaneous transplanted crop of the same field 	<ul style="list-style-type: none"> • Application of potash • Inter culturing • Mulching through mechanical weeding for moisture conservation • Conservation tillage • Inter culturing • Protective spray of pesticides with adjuvant against Pest and diseases 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	<p>Medium land</p> <p>Clay loam to loam, deep soil</p>	<p>Rice – Jaya, Rajendra Mahsuri 1, Rajendra Suvasini</p> <p>Wheat- HD-2733, PBW-343, HP-1731, HD-2824</p>	<ul style="list-style-type: none"> • Life saving irrigation • Gap filling by pulling extra rice seedling from simultaneous transplanted rice crop • Gap filling through Dapog nursery 	<ul style="list-style-type: none"> • Application of potash • Mulching by weeds for moisture conservation • Conservation tillage • Inter culturing • Protective spray of pesticides with adjuvant against Pest and disease 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

	Low land Sandy clay to loamy clay, deep soil	Rice-wheat-Green gram Rice- Rajshree, Santosh , MTU1001, Sita, Rajendra Suwasni, R. Mahsuri 1 Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Greengram – Samrat, Pusa Vishal, SML 668	<ul style="list-style-type: none"> • Life saving irrigation • Gap filling through Dapog nursery • Gap filling through extra Rice seedling from simultaneous transplanted Rice field 	<ul style="list-style-type: none"> • Application of potash must at final land preparation • Inter culturing • Mulching by weeds for moisture conservation • Conservation tillage • Intercul turing • Spray potassic fertilizer with adjuvant at vegetative stage • Protective spray of pesticides with adjuvant against Pesticides and disease 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Low Land (Deep Water) Sandy clay to loamy clay, deep soil	Rice – Fallow – Greengram Rice – Swarna Sub 1	No change	<ul style="list-style-type: none"> • Top dressing of neem based Urea @ 50kg/ha in rice crop or application of mud ball urea 	

Condition	Major Farming situation ^a	Normal Crop/cropping system ^b	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measues ^d	Remarks on Implementation ^e
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					

At vegetative stage	Deep sandy loam to loam soil	<p>Rice-Potato Rice –Wheat Pigeonpea (Arhar)- Greengram Rice- Prabhat, Dhanlaxmi, Richharia, Saroj Potato – PJ376, Rajendra Aloo-1,2,3, Kufri Jyoti, Kanchan Wheat- HD 2733, PBW 343, HP 1731, HD 2824 Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Greengram – Samrat, PusaVishal, SML 668, PDM 54, T-44</p>	<ul style="list-style-type: none"> • Gap filling of existing rice crop • Postponement of top dressing • Protective spray of pesticides with adjuvant against BLB, BLAST & Helminthosporum leaf spot 	<ul style="list-style-type: none"> • Inter culturing/weeding and mulching by weeds • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea on the crops • LCC based N application in Rice 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium land Deep clay loam to loam soil	<p>Rice-wheat-Green gram Rice - Rajendra Bhagawati, Rajendra Suwasni, Rajshree, Prabhat Wheat- HD-2733, PBW-343, HP-1731, HD-2824 Green gram- SML 668, Pusa Vishal, Samarat</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 & Helminthosporum leaf spot 	<ul style="list-style-type: none"> • Inter culturing/weeding and mulching by weeds • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea on the crops 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

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	Up land Deep Sandy loam to loam soil	Maize-Wheat Vegetable – Wheat Maize - Shaktiman-1,2,3,4 Suwan, Ganga-11, Deoki, Pusa early hybrid Maize-3 Wheat- HD-2733, PBW-343, HP-1731, HD-2824	<ul style="list-style-type: none"> • IPM practices • Spray of pesticides with spreader • Clipping of maize leaves 	<ul style="list-style-type: none"> • Inter culturing/weeding and mulching by weeds • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Medium land Deep clay loam to loam soil	Rice – Wheat Rice- Prabhat,MTU1010 Dhanlaxmi, Richharia, Saroj Wheat- HD2733, K 307, PBW-343, HP-1731, HD-2824	<ul style="list-style-type: none"> • IPM practices • Spray of pesticides with spreader • If Rice crop withers & gets damaged Urd/Sesame-Wheat should be followed • IPM practices • Spray of pesticides with spreader 	<ul style="list-style-type: none"> • Inter culturing/weeding and mulching by weeds • Conservation tillage • Life saving irrigation • Spray of potash and nitrogen fertilizer with adjuvant 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
		Pigeonpea (Arhar)- Greengram Pigeonpea : Bahar, Narendra Arhar-1		<ul style="list-style-type: none"> • IPM practices • Spray of pesticides with spreader 	<ul style="list-style-type: none"> • Inter culturing and mulching by weeds • Life saving irrigation • Conservation tillage • Spray of potassic fertilizer with adjuvant

	<p>Low land</p> <p>Sandy clay to loamy clay, deep soil</p>	<p>Rice-wheat-green gram</p> <p>Rice- Rajshree, Santosh , MTU 1010, Sita, Rajendra Suwasni, Rajendra Sweta, Rajendra Mahsuri 1</p> <p>Wheat- HD-2733, PBW-343 HP-1731, HD-2824</p> <p>Green Gram- SML 668, Pusa Vishal, Samrat</p>	<ul style="list-style-type: none"> • IPM and IDM 	<ul style="list-style-type: none"> • Inter culturing • Mulching by weeds • Life saving irrigation • Conservation tillage • Spray of potassic fertilizer with adjuvant, 	<p>Seeds from RAU, Pusa, NSC, TDC , BRBN etc</p>
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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)	Deep sandy loam to loam soil	<p>Rice-Wheat</p> <p>Maize - Potato</p> <p>Rice-Prabhat, Dhanlaxmi, MTU 1010, Saroj, Pusa 677, Pusa 834</p> <p>Wheat- HD 2733, PBW 343, HP 1731, HD 2824</p> <p>Potato – Kufri Jyoti, Kufri Ashoka</p> <p>Maize – Composites</p>	<ul style="list-style-type: none"> • Spray of potassic fertilizer with adjuvant • IPM practices • Life saving irrigation • Mulching • Thinning • Clipping of leaves in maize • Rice and wheat to be saved from moisture stress at milk stage 	<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/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • Irrigation channel be cleaned for preventing moisture loss through seepage 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	<p>Medium land</p> <p>Deep clay loam to loam soil</p>	<p>Maize-wheat</p> <p>Rice - Wheat</p> <p>Maize - Shaktiman-1,2,3,4, Suwan, Ganga-11, Deoki, Pusa early hybrid Maize-3</p> <p>Wheat- HD 2733, PBW 343, HP 1731, HD 2824, K 9107</p> <p>Rice – Rajendra Mahsuri 1, Sarju 52, MTU 1010, Sita Rajendra Sweta</p>			

		Pigeonpea (Arhar)- Bahar, Narendra Arhar-1		<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/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stages of growth • To clean irrigation channel for preventing loss of moisture through seepage 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Low land Sandy clay to loamy clay, deep soil	<p>Rice-wheat-Green gram</p> <p>Rice- Rajshree, Santosh , Satyam, Rajendra Suwasni, Rajendra Sweta, MTU 1001, MTU 7029, Rajendra Mahsuri 1</p> <p>Wheat- HD 2733, PBW 343, HP 1731, HD 2824</p> <p>Greengram- SML 668, Pusa Vishal, Samrat</p>		<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/Pulses /Oilseeds/ Vegetables • Stored water to be used at critical stage of growth • To clean irrigation channel for preventing loss of moisture through seepage 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

2.1.2 Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures ¹	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Up land	Rice – Wheat Rice – Rabi Maize	Early Rice – Wheat Early Rice – Rabi Maize Rice – Prabhat, Saroj, MTU 1010, Pusa 677, Dhanlaxmi Wheat – HD 2733, HD 2824 K 9107, K 307, PBW 343	<ul style="list-style-type: none"> • Dapog Nursery • Direct seeding of rice • Use of Rice drum seeder • SRI technique • Timely irrigation in wheat at the most critical stage i.e. CRI stage whereas in Rabi maize upto 10 days after tassel emergence • Zero tillage in wheat for Resource Conservation 	<ol style="list-style-type: none"> 1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Seed drills under RKVY 3. Supply of seeds through NFSM
	Medium Land	Rice – Wheat – Greengram Rice – Rabi Maize	No change No change Rice – Saroj, Prabhat, MTU 1010, P 677 Rajendra Bhagwati	<ul style="list-style-type: none"> • Dapog Nursery • Use 20 days old seeding of rice • SRI technique • Use of RCT n the cropping system 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

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	Medium Land	Rice – Wheat	Early Rice varieties be taken Early Rice varieties be taken	<ul style="list-style-type: none"> • Restrict Nitrogen dose • SRI technique • Use more potassic fertilizers • Use of pre 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc
	Deep clay loam to loam soil	Rice – Maize	Rice – MTU 1010, Prabhat Dhanlaxmi, Pusa 834,		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
			Rajendra Bhagwati Wheat – K 9107, PBW 343 HP 1744	emergence Weedicides to check weed problem in Rice <ul style="list-style-type: none"> • Use potassic fertilizers at PI stage in rice • Use of RCT in the cropping system 	

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Non release of water in canals under delayed onset of monsoon in catchment	Medium Land Deep clay loam to loam soils	Rice – Wheat Rice – Rabi Maize Rice – Sita, Sarju 52, R. Suwasini, Saroj	Direct Sown Rice – Lentil/ Direct Sown Rice – Early Pea/ Direct Sown Rice- Toria/ Satawar-Early Pea-Greengram/ Aswagandha - Vegetable – Greengram/ Toria – RAUTS 17,Bhawani Early Pea – Pusa Prabhat, Harbhajan Rice – Sita, Sarju 52, R. Suwasini, Saroj	<ul style="list-style-type: none"> • Use Basal P and K only in direct seeded Rice • Use pre-em weedicides in Rice • Top dress N at 30 DAS in Direct Seeded Rice • SRI technique with early Rice varieties • LCC based N application • Potash application at PI stage • Use of RCT in the cropping system 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

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

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall	Upland Deep loamy to silt loam soils	Rice-Wheat/ Oilseeds/ Pulses/ Rabi maize	Short duration Rice- Toria – Greengram/ Blackgram/ Sesame Satawar-Lentil-Fodder Aswagandha-Lentil- Greengram+Sorghum Rice-Prabhat, Dhanlaxmi, Richharia, MTU1010, Saroj, Santosh Sesame- Krishna, Pragati Blackgram- T-9, Navin, Pant Urd-30 , Pant Urd-19	<ul style="list-style-type: none"> • Dapog nursery for rice • Direct seeding of rice • Life saving irrigation • Spray of potassic fertilizer with adjuvant • Mulching • Application of organic manure and vermicompost • SRI technique of Rice • LCC based N application • Use of pre-em weedicide in Rice to check weed menace • Irrigation scheduling based on critical stages of growth • Brown manuring in direct sown Rice 	1. Seeds from RAU, Pusa, NSC, TDC , BRBN etc 2. Tube well through MSTP
	Medium Land Deep clay loam to loam soils	Rice-Wheat/ Pulses/ Maize / Rice- Jaya, MTU 7029,	Short duration of Rice ⁷ Pigeonpea/ Blackgram/ Sesame Rice- Rajendra Bhagawati	<ul style="list-style-type: none"> • Brown manuring in direct sown Rice 	Seeds from RAU, Pusa, NSC, TDC , BRBN etc

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
		Saroj, R. Mahsuri 1, Santosh, R. Kasturi, Sita Wheat- HD 2733, PBW 343, HP 1731, HD 2824	MTU 1010, Pusa 834 Prabhat, Saroj, Santosh Pigeonpea - Pusa-9 Narendra Arhar-I Rabi Maize- Saktiman-1,2,3,4, Laxmi, Deoki, Rajendra Hybrid 1,2 Sesame- Krishna Pragati Blackgram- T-9, Navin, Pant Urd-30 , Pant Urd-19		

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 • Re transplanting through Dapog nursery if needed • Gap filling from extra seedling of Transplanted Rice crop • Re sowing through drum seeder 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged i.e. Toria var. RAUTS 17, Bhawani etc. 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged Eg. Toria/Early Pea (Vegetable) • Harvest at physiological maturity • Spray 5% Nacl solution to check germination of Rice spikelets 	<p>Storage at safer place</p> <p>- Protection measure against storage insect pest</p>
Maize	<ul style="list-style-type: none"> • Drainage management • Gap filling from extra seedlings grown the same field rather than fresh sowing Of Maize seed • Re sowing, if completely damaged 	<ul style="list-style-type: none"> • Drainage management • Alternative maize or other rabi crop if totally damaged 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged • Harvest at physiological maturity 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • Drainage management • September sowing if Kharif Arhar is completely damaged • Gap filling if needed 	<ul style="list-style-type: none"> • Drainage management • Alternative maize or other rabi crop if totally damaged 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged • Harvest at physiological maturity 	Storage at safer place
Vegetable	<ul style="list-style-type: none"> • Re sowing , if required • Replanting 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drainage management 	Storage at safer place
Horticulture				
Mango	<ul style="list-style-type: none"> • Drainage management • Replanting on raised platform if completely damaged • Gap filling 	<ul style="list-style-type: none"> • Drainage management • Need based IPDM 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management • Harvesting at proper maturity 	<p>Spray of mild fungicide to avoid fungal growth. Dipping fruits in 50°C warm water for 10 minutes would enhance the</p>

				self life of fruits
Litchi	<ul style="list-style-type: none"> • Drainage management • Replanting, on raised platform if completely damaged 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Spray and pasting of trunk • Drenching with copper fungicide 	
Banana	<ul style="list-style-type: none"> • Drainage management • Replanting, if completely damaged • De suckering of new suckers 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Spray and pasting of trunk • Propping 	
Papaya	<ul style="list-style-type: none"> • Drainage management • Replanting, if completely damaged 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Spray and pasting of trunk 	
Heavy rainfall with high speed Winds in a short span				
Rice	<ul style="list-style-type: none"> • Drainage management • Replanting if completely damaged • Gap filling if needed 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged i.e. Toria 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally damaged 	Storage at safer place
Maize	<ul style="list-style-type: none"> • Re sowing If completely damaged • Gap filling if needed by extra seedlings transplanted simultaneously of the same field • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Alternative maize or other crop if totally damaged 	<ul style="list-style-type: none"> • Drainage management • Sequential crop if totally Damaged 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • Re sowing If completely damaged • Gap filling if needed • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Alternative crop if totally damaged eg. Rabi, Maize, Vegetable 	<ul style="list-style-type: none"> • Drainage management • Alternative crop if totally Damaged 	Storage at safer place
vegetable	<ul style="list-style-type: none"> ▪ Drainage management ▪ Gap filling 	<ul style="list-style-type: none"> • Drainage management 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicide 	
Horticulture				
Mango	<ul style="list-style-type: none"> • Drainage management • Need based IPDM • Replanting if substantially damaged • Staking/Providing wind break 	<ul style="list-style-type: none"> • Drainage management • Need based IPDM • Drenching with copper fungicides 	<ul style="list-style-type: none"> • Drainage management • Harvest at proper time • Spray of Bordeaux mixture to ward off fruit fly and fungal 	

		<ul style="list-style-type: none"> • Providing Wind Break 	infection, Neem based plant Protection measure	
Litchi	<ul style="list-style-type: none"> ▪ Drainage management ▪ Gap filling ▪ Staking 	Drainage management	<ul style="list-style-type: none"> • Drainage management • Drenching with copper Fungicide 	
Banana	<ul style="list-style-type: none"> • Drainage management • Replanting if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Staking 	<ul style="list-style-type: none"> • Drainage management • Propping • Harvest at proper time 	
Guava	<ul style="list-style-type: none"> • Drainage management • Replanting if substantially damaged 	<ul style="list-style-type: none"> • Drainage management • Drenching with copper fungicides 	<ul style="list-style-type: none"> • Drainage management • Harvest at proper time 	
Outbreak of pests and diseases due to unseasonal rains				
Rice	<ul style="list-style-type: none"> • Seedling treatment with Carbendazim + Emidachloroprid • Spray of pesticides with adjuvant 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	Storage at safer place
Maize	<ul style="list-style-type: none"> • Application of granular insecticides viz. Thimet 10 g/Carbofuran 3g in whorl of maize 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • Use of pesticides/insecticides 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides (Kelthel) with adjuvant • Drainage management 	Storage at safer place
Vegetable	<ul style="list-style-type: none"> • Drainage management • Spraying of insecticide & fungicide 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	Safe storage & transportation
Horticulture				
Mango	<ul style="list-style-type: none"> • Spray of pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	

Litchi	<ul style="list-style-type: none"> • Spray of pesticides (eg. Kelthel)with adjuvant to ward off attack of litchi mite • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides (eg. Kelthel) with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides (eg. Kelthel) with adjuvant • Drainage management 	
Banana	<ul style="list-style-type: none"> • Spray of pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	
Guava	<ul style="list-style-type: none"> • Spray of pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	<ul style="list-style-type: none"> • Spray of specific pesticides with adjuvant • Drainage management 	Mild insecticide to be applied to check fruit fly infection

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹	Seedling/ Nursery stage	Vegetative stage	Reproductive stage	At harvest
Water logging/Partial inundation	Seedling/ Nursery stage	Vegetative stage	Reproductive stage	At harvest
Rice For such situation var. like Swarna-Sub-I & local var. of Desaria Barogar etc. should be taken	<ul style="list-style-type: none"> • Drainage management • Re transplanting through Dapog nursery/community nursery if completely damaged • Gap filling 	<ul style="list-style-type: none"> • Drainage management • Alternative crops if totally damaged • Gap filling by simultaneously transplanted Rice seedling of same field • 40-45 days old seedlings may be used • Kharuhan (double transplanting) be practiced 	<ul style="list-style-type: none"> • Drainage management • Harvest at physiological maturity • Lentil as paira crop can be taken (var. PL 406 suited to paira crop) 	Storage at safer place Spray 5% Nacl solution to check germination of Rice spikelets
Maize	<ul style="list-style-type: none"> • Drainage management • Re sowing if substantially damaged • Gap filling, if needed 	<ul style="list-style-type: none"> • Drainage management • Alternative crops if totally damaged like maize or sequential crop i.e. Toria (RAUTS 17, Bhawani) 	<ul style="list-style-type: none"> • Drainage management • Harvest at physiological maturity 	Storage at safer place
Pigeonpea	<ul style="list-style-type: none"> • Drainage management • Re sowing if substantially damaged • Gap filling if needed 	<ul style="list-style-type: none"> • Drainage management • Any rabi crop can e taken, if completely damaged 	<ul style="list-style-type: none"> • Drainage management • Harvest at physiological maturity 	Storage at safer place Protection against storage insect-pest

Horticulture				
Mango	<ul style="list-style-type: none"> • Replanting if substantially damaged • Gap filling • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	Judicious harvesting
Litchi	<ul style="list-style-type: none"> • Gap filling • Replanting if substantially damaged • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	Judicious harvest
Banana	<ul style="list-style-type: none"> • Replanting if substantially damaged • Gap filling • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	Judicious harvesting
Guava	<ul style="list-style-type: none"> • Replanting if substantially damaged • Gap filling • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	<ul style="list-style-type: none"> • Drenching with copper fungicides • Drainage management 	Judicious harvesting
Continuous submergence for more than 2 days				
Rice (for such situation Swarna Sub-1 should be grown)	<ul style="list-style-type: none"> • Gap filling, if needed • Re-sowing after receding of flood, if completely damaged 	<ul style="list-style-type: none"> • Replanting through Kharuhan (double transplanting) by 3-4 seedlings per hill • Short duration rice variety 	<ul style="list-style-type: none"> • Toria/Late wheat if completely damaged 	Storage at safer place Spray 5% NaCl solution to check germination of Rice spikelets
Maize	<ul style="list-style-type: none"> • Re-sowing after receding of flood, if completely damaged 	<ul style="list-style-type: none"> • Re sowing or gap filling as the case may be 	<ul style="list-style-type: none"> • Toria/Late wheat if completely damaged 	Storage at safer place Protection against storage insect pest
Horticulture				
Mango	<ul style="list-style-type: none"> • Drainage management 			
Guava	<ul style="list-style-type: none"> • Drainage management 			
Banana	(i) Drainage management			
Sea water intrusion³				

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

Extreme event type	Suggested contingency measure ^f			
	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 (Terminal heat)	
Horticulture				
Mango	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Litchi	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Papaya	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Cold wave				
Wheat		Irrigation, inter culturing, mulching by weeds		
Maize		Irrigation, inter culturing, mulching by weeds		
Mustard		Irrigation, inter culturing, mulching by weeds		
Potato		Irrigation, inter culturing, mulching by weeds, Spray Mancozeb 0.2% or Ridomil MZ 0.1%		
Pulses		Irrigation, inter culturing, mulching by weeds		
Horticulture				
Bhendi		Irrigation, inter culturing, mulching by weeds		
Brinjal		Irrigation, inter culturing,		

		mulching by weeds		
Chili		Irrigation, inter culturing, mulching by weeds		
Tomato		Irrigation, inter culturing, mulching by weeds		
Lauki		Irrigation, inter culturing, mulching by weeds		
Frost				
wheat		Irrigation, inter culturing, mulching by weeds		
Chickpea		Irrigation inter culturing, mulching by weeds		
Pigeonpea		Irrigation inter culturing, mulching by weeds		
Lentil		Irrigation inter culturing, mulching by weeds		
Horticulture				
Bhendi	Treat the seeds in 0.2% soln of Dithane M-45	Irrigation, inter culturing, mulching by weeds		
Brinjal		Irrigation inter culturing, mulching by weeds		
Chilli		Irrigation inter culturing, mulching by weeds		
Tomato & Potato	Treat the seeds in 0.25% soln of Dithane M-45 (Mancozeb 2.5kg/ha)	Earth up to 15cm ht. Irrigation, inter culturing, mulching by weeds	Spray Dithane M-45/ Mancozeb @ 2.5 gm/lit of water in 3 rd week of December at 10 days interval 3 times	Harvest in dry weather

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. 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) Sorghum - at flowering stage. (c) Oat (d) Hybrid Napier – 40-45 day old. (e) Water hycianth mixing with Rice straw in ratio of 4:1 with 70 kg molasses /ton of clean water hycianth. (f) Potato leaves mixing with wheat straw in ratio of 7:1 and should be supplemented with 3% molasses. <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. <ol style="list-style-type: none"> 4. Development & storage of: – <ol style="list-style-type: none"> (a) Complete Feed Block (CFB) (b) Urea-Molasses-Mineral-Block (U.M.M.B) 5. Development of Fodder Bank 	<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 6. Subabul <p>Use of unconventional feed stuff:</p> <ol style="list-style-type: none"> (i) Aquatic Plants – water hycianth (i) Lotus (ii) Aquatic weeds 	<p>Production of forage crops</p> <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
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>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</p>	<p>Sanitation, de worming, treatment, health camps Culling of Sick animals and disposal of carcass</p>

	<p>So, necessary vaccination of livestock and poultry should be done against economically important contagious disease.</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>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 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 Diarrhoeal diseases outbreaks can 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>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 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 parasite 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>
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Cyclone			

Heat wave and cold wave			
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^s based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	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 Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity</p> <p>Pigs Hemorrhagic Septicemia Vaccine PPR Vaccine</p>			

	<p>FMD Vaccine Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity.</p> <p style="text-align: center;">Dogs</p> <p>Rabies Vaccine</p> <p style="text-align: center;">Poultry</p> <p>Mareks disease vaccine RDV (F₁ & R₂B), FPV, IBRV & IBDV (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 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</p>			
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	<p>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, dewormer, ointment, antsnake 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 vaccines, Veterinary drugs, workers protection uniform etc.</p>			
Cyclone				
Heat wave and cold wave				

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
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	(ii) Arrangement of aeration. (iii) Addition of water • Monitoring of water quality • Reduction of manuring according to water level.	
2) Floods			
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			
A. Capture			
B. Aquaculture			
4. Heat wave and cold wave			
A. Capture			
B. Aquaculture			

^a based on forewarning wherever available