State: BIHAR

Agriculture Contingency Plan for District: NAWADA

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Northern Plain, Hot Subhumib (Dry) Eco-Region (9.2)		
	Agro-Climatic Zone (Planning Commission)	Mid 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)	Zone – III (Rohtas ,Bhojpur , Buxar , Bhabhua , Arwal . Patna , Nalnda , Nawada , Shekhpura , Jahanabad , Aurngabad , Gaya , Munger , Bhagalpur , Banka , Jamui , Lakhisarai		
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**
		24^0 31' - $25^0 7^{0'}$ N	85^0 17'- $86^0$30 E	85 meter
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Research Station, Patna		
	Mention the KVK located in the district with address	Sarvodya Ashram ,Sokhodeora, Block Kawakol, District – Nawada		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Indian Meteorology Department, Airport Complex, Patna		

1.2	**Rainfall (Zone-I)**	**Normal RF(mm)**	**Normal Rainy days (number)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (Jun-Sep):	887.1	34	2^{nd} week of June	2^{nd} week of October
	NE Monsoon(Oct-Dec)/ Post Monsoon	72.1	4		

	Winter (Jan- March)	48.9	4	-	-
	Summer (Apr-May)	29.2	2	-	-
	Annual	1037.3	47	-	-

1.3	**Land use pattern of the district**	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	249.4	147.47	56.552	34.445	NA	NA	NA	10.370	NA	NA

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	Sandy to sandy loam	NA	NA
	Sandy loam to clay loam	NA	NA

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	147.47	130%
	Area sown more than once	44.24	
	Gross cropped area	191.71	

1.6	**Irrigation**	Area ('000 ha)
	Net irrigated area	90.763
	Gross irrigated area	116.558
	Rainfed area	NA

	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals	NA	10.178	
	Tanks	NA	0.771	
	Open wells	NA	77.829	
	Bore wells	NA		
	Lift irrigation schemes	NA		
	Micro-irrigation	NA		
	Other sources (please specify)	NA	2.656	
	Total Irrigated Area	NA	90	
	Pump sets	7735		
	No. of Tractors (551) + Power tiller (761)	1312		
	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			Fluoride >1.5mg/L, iron > 1 mg/L
	Wastewater availability and use	14		
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures) (Specify year 2008-09)

1.7	**Major field crops cultivated**	**Area (‘000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice	0	0	85.942	0	0	0	0	85.942
	Pigeonpea	0	0	3.620	0	0	0	0	3.620

	Wheat	0	0	0	0	0	48.013	0	48.013
	Lentil	0	0	0	0	0	3.949	0	3.949
	Chickpea	0	0	0	0	0	3.946	0	3.946
	Greengram	0	0	0	0	0	0	1.240	1.240

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	1.094		
	Guava	0.506		
	Banana	0.308		
	Lemon	0.431		
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Potato	5.511		
	Sponge Gourd	0.634		
	Tomato	0.743		
	Cauliflower	1.272		
	Cabbage	0.721		
	Brinjal	1.202		
	Onion	0.938		

	Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
	NA	**NA**	**NA**	**NA**
	Total are in Bihar	**Approx-5000ha**		
	Plantation crops	**Total**	**Irrigated**	**Rainfed**
	NA	**NA**	**NA**	**NA**
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	NA	**NA**	**NA**	**NA**
	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)	198.970	191.631	390.601
	Improved cattle	1.484	2.718	4.202
	Crossbred cattle	3.222	7.130	10.352
	Non descriptive Buffaloes (local low yielding)	56.067	111.758	167.825
	Descript Buffaloes	23.307	2.703	26.010
	Goat	-	-	255.578
	Sheep	-	-	2.753
	Others (Pig)	-	-	57.084
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**	

	Commercial	140	224.000
	Backyard		65.247

1.10 Fisheries (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department) Bihar is a land locked state and only inland fisheries resources are available	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	154	**511**	428

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)	**3184**	3.2/ha	5.381
Others			

1.11 Production and Productivity of major crops

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Rice	134.671	1764.49	0	0	0	0	0	0	0

	Pigeonpea	2.658	719.28	0	0	0	0	0	0	0
	Wheat	0	0	88.530	1750.98	0	0	0	0	0
	Lentil	0	0	2.954	603.31	0	0	0	0	0
	Chickpea	0	0	3.591	740.76	0	0	0	0	0
	Green gram					0.381	483.80			
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango							9.908		
	Banana							12.933		
	Guava							4.003		
	Lemon							3.046		

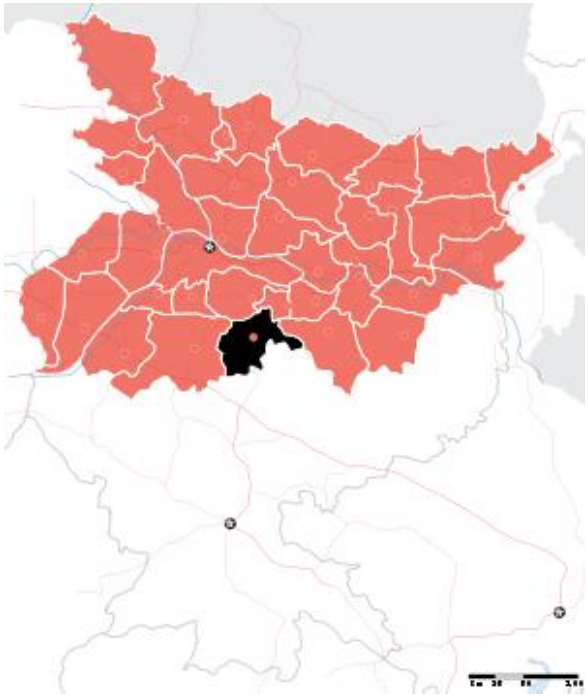
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Wheat**	**Maize**	**Lentil**	**Potato**
	Kharif- Rainfed					
	Kharif-Irrigated	4th week of May to 4th week of June		4th week of May to 4th week of June		
	Rabi- Rainfed					
	Rabi-Irrigated		3rd week of November to 3rd week of December		3rd week of October to3rd week of November	4th week of October to 3rd week of November

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood			
	Cyclone			
	Hail storm			

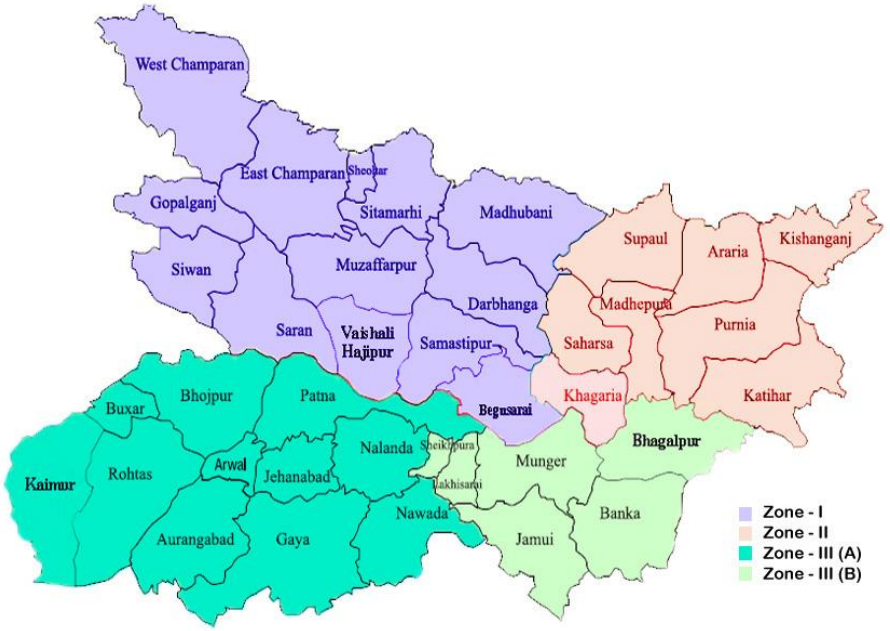
	Heat wave		√	
	Cold wave		√	
	Frost			
	Sea water intrusion			
	Pests and disease outbreak (specify)	√		
	Others (specify)			

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

Annexure I

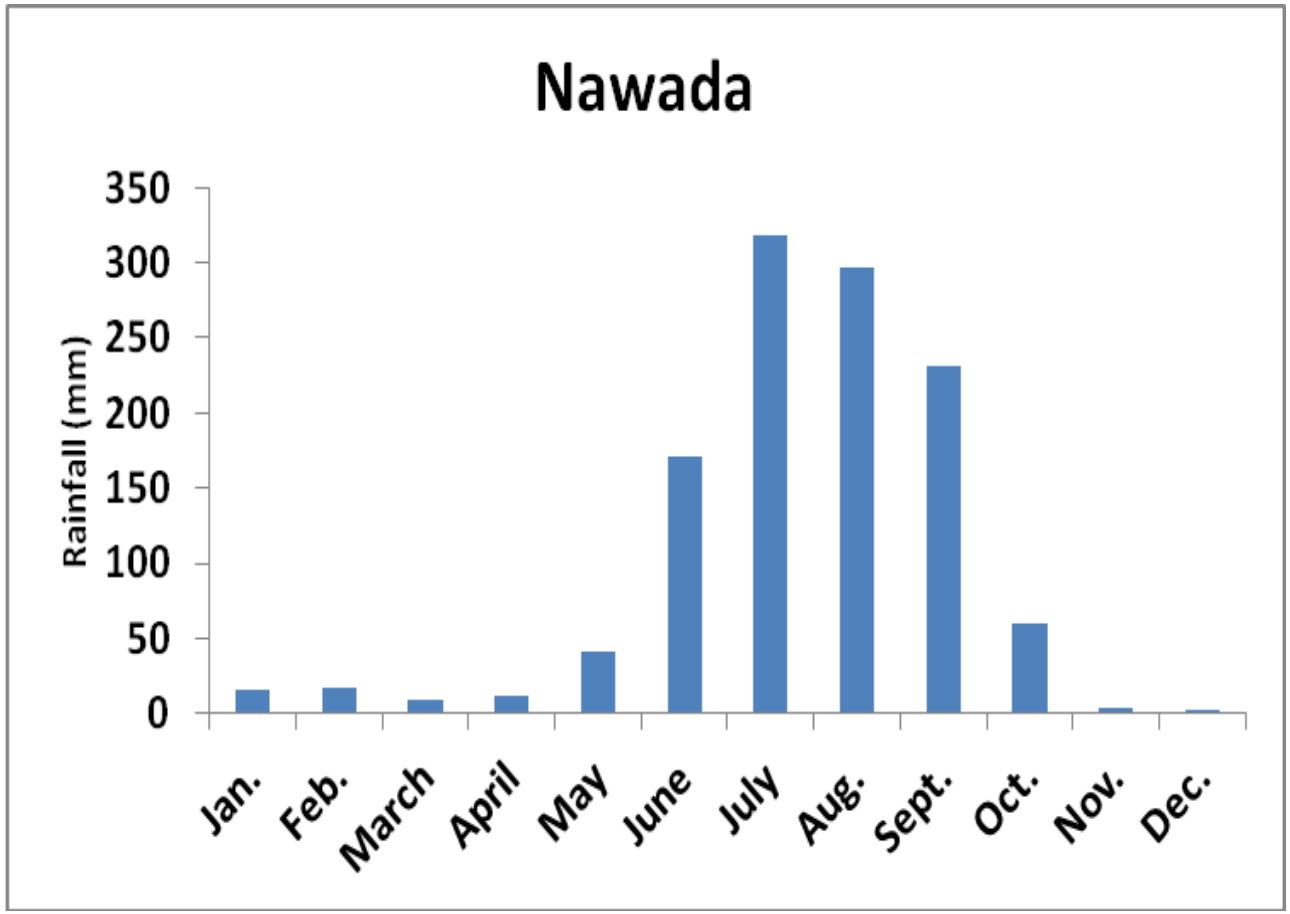


Agro climatic Zones of Bihar

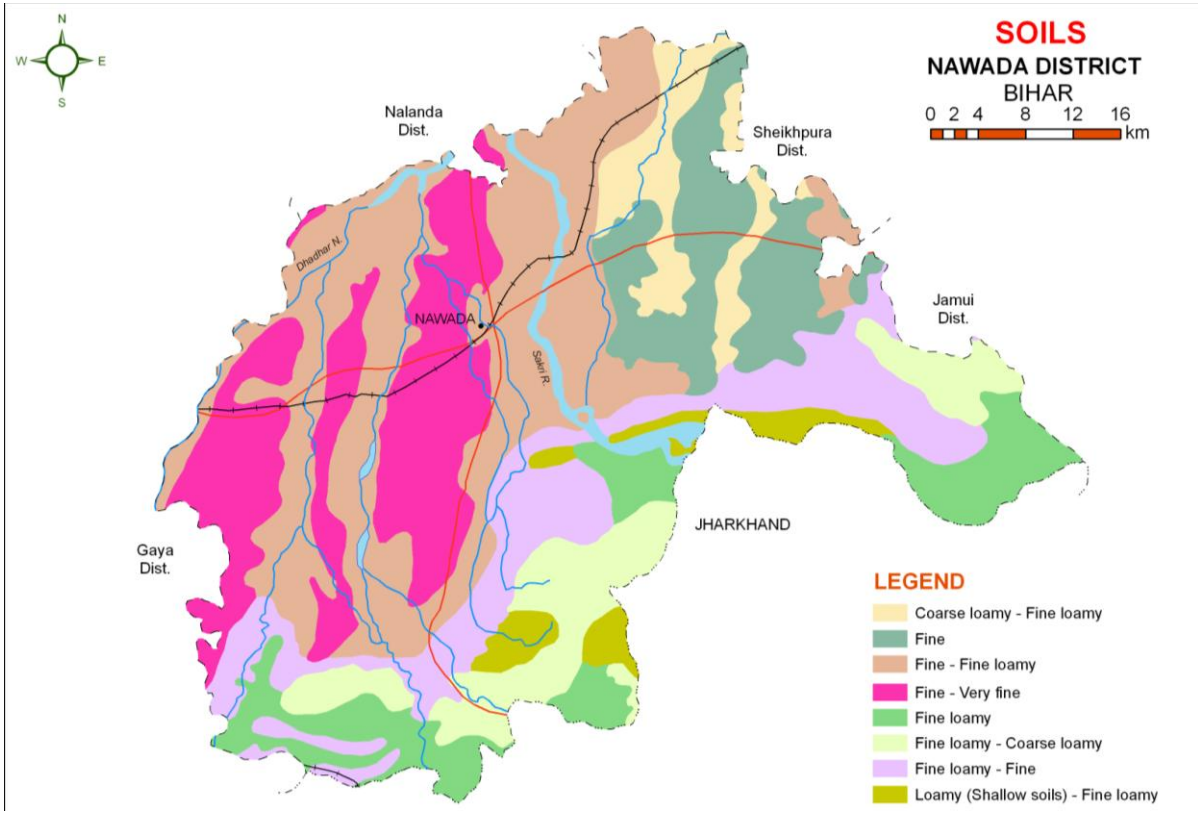


Source: krishi.bih.nic.in

Annexure II


Nawada
Rainfall (mm)
350
300
250
200
150
100
50
0
Jan.
Feb.
March
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.

Annexure III



Source : NBSS& LUP, Regional Centre, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks 1st week of July	Medium deep, Sandy to sandy loam	Pigeonpea-Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Vegetable Maize:Deoki,Ganga -2 Tomato: S-22 , Navodaya , Pusa Rubi Chilli : Pusa Jwala , Pusa Sadabahar , G3,4 Brinjal: Swarna, Pratisha, PPL , Pant Samrat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039 Horsegram: Local	• Normal package of practices • Life saving irrigation • Balanced use of fertilizers • Use of manures	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Deep Sandy loam to clay loam	Rice- Wheat-Greengram/ Rice –Vegetable/ Rice-Wheat	Rice-Wheat – Greengram/ Rice – Vegetable Rice: Rajendra Bhagawati, Rajendra Suwasni,, Prabhat Wheat: HD-2733, PBW-343,	• Normal package of practices • Direct seeding of rice can be done • Life saving irrigation • Balanced use of fertilizers • Use of manures	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

			HP-1731 HD 2824 , K307 Greengram: PDM -84 -139, Pusa Vishal , SML -668 Cabbage – Golden Aare Pride of India Cauliflower- Patna early ,Hajipur early , Kuwan		
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil/Chickpea Fallow – Lentil / Chickpea	Rice – Wheat Rice – Wheat – Greengram/ Rice – lentil / Greengram/ Rice: Sita , RM -1 Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343, HP-1731 , HD 2824, K-307 Lentil: DPL 62 , PL639 , Chickpea :C235 , P256	• Normal package of practices • Direct seeding of rice can be done • Life saving irrigation • Drum seedling • Balanced use of fertilizers	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 4 weeks 3rd week of July	Medium deep Sandy to sandy loam	Pigeonpea-Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Vegetable Maize: Dewki, Ganga -2 Tomato: S-27 , Navodaya Pusa Rubi Chilli: Pusa Jwala , Pusa Sadabahar , G34	• Normal package of practices ▪ Life saving irrigation	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

			Brinjal: Swarna Pratisha, PPl , Pant Smrat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039 Horsegram: Local		
	Medium land Deep Sandy loam to Clay loam	Rice- Wheat-Greengram/ Rice –Vegetable/ Rice-Wheat	Rice-Wheat – Greengram/ Rice – Vegetable Rice: Rajendra Bhagawati, Rajendra Suwasni,, Prabhat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139, Pusa Vishal , SML -668 Cabbage – Golden Acre, Pride of India Cauliflower- Patna early ,Hajipur early , Kuwan	• Full basal dose of NPK • Life saving irrigation • Application of Potash • Seedling raising by Dapog method • Balanced dose of fertilizer	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil/Chickpea Fallow – Lentil / Chickpea	Rice – Wheat/ Rice – Wheat – Greengram/ Rice – Lentil /Chickpea Rice: Sita , RM -1 Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343, HP-1731 , HD 2824 , K-307 Chickpea: C235 , P256 Lentil – DPL 62 , PL639, Arun	• Enhanced dose of nitrogen with full basal dose of NPK at transplanting • Old age rice seedling of 40-45 days may be used with four seedling per hill with close spacing	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season	**Major Farming**	**Normal Crop/cropping**	**Change in crop/cropping**	**Agronomic measures[d]**	**Remarks on**

drought (delayed onset)	situation[a]	system[b]	system[c]		Implementation[e]
Delay by 6 weeks 1st week of August	Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Vegetable Maize: Dewki . Ganga -2 Tomato: S-27 , Navodaya , Pusa Rubi Chilli: Pusa Jwala , Pusa Sadabahar , G34 Brinjal: Swarna Pratisha, PPl , Pant Samrat Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I ICPL 88039	• Normal package of Practices • Application of potassic fertilizer at adjuvant	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Deep Sandy loam to clay loam	Rice- Wheat/ Rice –Toria/ Rice-Vegetable	Rice-Wheat/ Rice – Toria / Rice Rice: Rajendra Bhagawati, Rajendra Suwasni Prabhat , Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Toria: Panchali , Bhavani ,	• Enhanced basal dose of NPK to boost the early vegetative growth • Application of Potassic fertilizer with adjuvant • Direct seedling of Rice or Drum seedling • Protective spray of pesticides with adjuvant against BLB & BLAST • Zero Tillage for Rice & wheat to compensate the time	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

	Lowland Sandy loam to clay loam	Rice – Wheat/ Rice – Lentil/Chickpea Fallow – Lentil/Chickpea	Rice – Wheat/ Rice – Lentil / Chickpea Rice: Sita , RM -1, Rajendra Suwasni, Rajendra Sweta Wheat: PBW-343, HP-1731 , HD 2888 , K-307 Chickpea: C235 , P256 Lentil: DPL 62 , PL639	• Zero tillage for Rice and wheat to make up the time • Direct seeding of Rice or Drum seedling • Application of Potassic fertilizer at vegetative stage • Protective spray of pesticides • Enhanced basal dose of NPK	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 8 weeks (Specify month) 3rd week of August	Medium deep, Sandy to sandy loam	Pigeonpea-Pigeonpea/ Maize - Vegetable	Pigeonpea – Pigeonpea/ Maize – Toria Maize: Dewki, Ganga -2 Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL- 88039 Horsegram: Local Toria – panchali , Bhavani	• Spray of potassic fertilizer with adjuvant • Life saving irrigation to Rice nursery raised • Protective spray of pesticides with adjuvant against pest & disease	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Deep Sandy loam to clay loam	Rice- Wheat/ Rice –Toria/ Maize – Wheat/ Maize – Vegetable	Rice – Wheat/ Pigeonpea- Pigeonpea / Rice – Toria/ Maize – Toria Rice: Rajendra Bhagawati, Rajendra Suwasni,Turanta, PR113, 115, Prabhat , Susksh Samrat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Toria:Panchali , Bhavani	• Zero tillage for Wheat to make up the time • Spray of potassic fertilizer with adjuvant in Rice at vegetative stage • Life saving irrigation to Rice nursery raised • Direct seeding of rice • Enhanced basal dose of NPK in rice to boost	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

			Maize: Dewki, Ganga -2 Pigeonpea–Pusa-9, Sharad Narendra Arhar-I	early vegetative growth • Protective spray of pesticides with adjuvant against pest & disease • Application of organic manure and vermicompost initially for Rice and other crops • Application of organic manure and vermicompost initially for Rice and other crops	
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Late Wheat/ Rice – Lentil/Chickpea Fallow – Lentil / Chickpea	Rice – Wheat/ Rice – Late Wheat – Greengram/ Rice – Lentil / Greengram Rice – Potato Rice: Sita , RM -1Rajendra Suwasni, Rajendra Sweta Wheat:HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Potato : Rajendra Aloo 1,2,3 , Kufri Joyti Ashoka , Pokhra Late Wheat: DBW-14, HUW-234, HD-2343	Application of organic manure and vermicompost initially for Rice and other crops	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing	Upland Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize – Vegetables/ Maize – Toria Pigeonpea: Bahar, Pusa-9	• Life saving irrigation • Gap filling of existing crop	• Application of potash • Inter culturing • Mulching through mechanical weeding for moisture conservation	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

leading to poor germination/ Crop stand etc 1st week of July		Narendra Arhar-I Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki, Pusa early hybrid Macca-3 Toria: RAU TS-17, Panchali , Bhawani		• Conservation tillage • Interculturing • Protective spray of pesticides with adjuvant against pesticides and disease	
	Medium land Sandy loam to clay loam	Maize-Wheat – Vegetable/ Rice –Wheat – Vegetable/ Rice – Wheat Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki Pusa early hybrid Macca-3 Rice: Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Jaya Wheat: HD-2733, PBW-343,HP-1731 , HD 2824 , K-307	• Life saving irrigation • Gap filling	• Application of potash • Inter culturing • Mulching through weeds for moisture conservation • Conservation tillage • Interculturing • Protective spray of pesticides with adjuvant against pesticides and disease	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
		Pigeonpea- Pigeonpea Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I ,	• Presowing irrigation • Higher seed rate • Gap filling	• Application of potash must at final land preparation • Inter culturing • Mulching through weeds for moisture conservation • Conservation tillage • Interculturing • Spray potassic fertilizer with adjuvant at vegetative stage • Protective spray of	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

				pesticides with adjuvant against pesticides and disease	
	Lowland Sandy loam to Clay loam	Rice-Wheat-Greengram/ Rice – Vegetable/ Rice – Wheat/ Greengram/ Rice – Lentil / Fallow – Lentil / Greengram Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasni, Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea- Pusa-236, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Greengram: SML-6-68, Pusa Vishal, Samarat	• Life saving irrigation • Gap filling	• Application of potash must at final land preparation • Inter culturing • Mulching through weeds for moisture conservation • Conservation tillage • Spray potassic fertilizer with adjuvant at vegetative stage • Protective spray of pesticides with adjuvant against Pesticides and disease	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At vegetative stage	Upland	Pigeonpea- Pigeonpea / Maize – Vegetables/ Maize – Toria Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki	• Gap filling of existing crop • Postponement of top dressing	• Inter culturing • Mulching through weeds, • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea on the crops and Zinc sulphate	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		Pusa early hybrid Macca-3 Toria: RAU TS-17, Panchali , Bhawani			
	Medium land	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Greengram/ Rice – Vegetable / Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea: Pusa-256, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize: Shaktiman-1,2,3,4, 5 Suwan, Ganga-11, Deoki Pusa early hybrid Macca-3 Greengram: SML-6-68, Pusa Vishal, Samarat	• Gap filling of existing crop • Postponement of top dressing • Protective spray of pesticides with adjuvant against BLB,	• Inter culturing • Mulching through weeds • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant • Spray (1%) Urea and zinc sulphate on the crops	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At flowering/ fruiting stage	Upland	Pigeonpea- Pigeonpea/ Maize – Vegetable/ Maize – Toria Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Maize - Shaktiman-1,2,3,4,5,Suwan,	• IPM practices • Spray of pesticides with spreader	• Interculturing • Mulching through weeds • Conservation tillage • Life saving irrigation • Spray of potassic fertilizer with adjuvant	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		Ganga-11, Deoki Pusa early hybrid Macca-3 Toria- RAU TS-17, Panchali , Bhawani			
	Medium land	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Chickpea/ Rice – Vegetable Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP- 1731 , HD 2824 , K-307 Chickpea :Pusa-236, KPG-39 (Uday), Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4, 5,Suwan, Ganga-11, Deoki Pusa early hybrid Maca-3	• IPM practices • Clipping of maize leaves • Spray of pesticides with spreader	• Interculturing • Mulching through weeds • Conservation tillage • Life saving irrigation • Spray of potash and nitrogen fertilizer with adjuvant	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland	Rice-Wheat-Greengram/ Rice – Vegetable/ Rice – Wheat/ Rice – Lentil /Chickpea Fallow – Lentil / Chickpea Rice:Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat: HD-2733, PBW-343,HP- 1731 , HD 2824 , K-307 Chickpea: Pusa-236, KPG-39 (Uday) Pusa-372, SG-2 Lentil: PL-406, Malika, Arun	• IPM practice • Life Saving Irrigation	• Inter culturing • Mulching through weeds • Life saving irrigation • Conservation tillage • Spray of potassic fertilizer with adjuvant,	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		Greengram: SML-6-68, Pusa Vishal, Samarat			

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**[a]	**Normal Crop/cropping system**[b]	**Crop management**[c]	**Rabi Crop planning**[d]	**Remarks on Implementation**[e]
	Sandy to Sandy loam	Pigeonpea- Pigeonpea/ Maize – Vegetables/ Maize – Toria Pigeonpea – Bahar, Pusa-9 Narendra Arhar-I Maize - Shaktiman-1,2,3,4, 5Suwan, Ganga-11, Deoki, Pusa early hybrid Macca-3 Toria- RAU TS-17, Panchali , Bhawani	• IPM practices • Spray of pesticides with spreader	• Open the furrow during evening and leave 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 BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Sandy loam – Clay Loam	Rice-Wheat-Greengram/ Rice- Wheat / Rice – Lentil / Chickpea/ Rice – Vegetable Maize – Wheat – Vegetable Rice-Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat- HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea :Pusa-236, KPG-39 (Uday),	• Life saving irrigation • Gap filling	• Open the furrow during evening and leave 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 BAU, Sabour, NSC, TDC, BRBN, KVK etc.

		Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Maize - Shaktiman-1,2,3,4,5 Suwan, Ganga-11, Deoki Pusa early hybrid Maca-3			
	Lowland	Rice-Wheat-Greengram/ Rice – Vegetable/ Rice – Wheat/ Rice – Lentil /Chickpea Fallow – Lentil / Chickpea Rice:Rajendra Bhagawati, Saroj, Rajendra Suwasini Santosh, R. Kasturi, Sita, Wheat: HD-2733, PBW-343,HP-1731 , HD 2824 , K-307 Chickpea: Pusa-236, KPG-39 (Uday) Pusa-372, SG-2 Lentil: PL-406, Malika, Arun Greengram: SML-6-68, Pusa Vishal, Samarat	• IPM practice • Life Saving Irrigation	• Open the furrow during evening and leave 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 BAU, Sabour, NSC, TDC, BRBN, KVK etc.

2.1.2 Drought - Irrigated situation

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]**
Delayed release of water in canals due to low rainfall	**NA**				

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]**
Non release of water in canals under delayed onset of monsoon in catchment	**NA**				

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]**
Lack of inflows into tanks due to insufficient /Delayed onset of monsoon	Upland Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize - Vegetables	Pigeonpea – Pigeonpea/ Maize – Toria/ Maize – Vegetable/ Maize-Horsegram Maize: Deoki, Ganga Tomato:S-27 , Navodaya , Pusa Rubi Chilli – Pusa Jwala , Pusa Sadabahar , G34 Brinjal - -Swarna Pratisha, PPl , Pant Smarat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039 Horsegram: Local Toria: Panchali , Bhavani	• Life saving irrigation • Spray of potassic fertilizer with adjuvant • Mulching • Application of organic manure and vermicompost	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Medium land Deep Sandy loam to clay loam	Rice- Wheat- Greengram/ Rice –Vegetable/ Rice – Wheat	Rice-Wheat – Greengram/ Rice – Vegetable/ Rice – Wheat Rice: Rajendra Bhagawati, Rajendra Suwasni	▪ Full basal dose of NPK ▪ Life saving irrigation ▪ Application of Potash	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK 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]**
			Prabhat , Turanta , Shusk Samrat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139 Pusa Vishal , SML -668 Cabbage: Golden Acre Pride of India Cauliflower: Patna early ,Hajipur early , Kuwan		

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 Medium deep Sandy to sandy loam	Pigeonpea- Pigeonpea/ Maize – Vegetables/ Maize – Toria	Pigeonpea – Pigeonpea/ Maize – Toria/ Maize – Vegetable/ Maize-Horsegram Maize: Deoki, Ganga Tomato:S-27 , Navodaya , Pusa Rubi Chilli – Pusa Jwala , Pusa Sadabahar , G34 Brinjal - -Swarna Pratisha, PPl , Pant Smarat Pigeonpea: Bahar, Pusa-9 Narendra Arhar-I , ICPL 88039	• Life saving irrigation • Spray of potassic fertilizer with adjuvant • Mulching • Application of organic manure and vermicompost	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK 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]**
			Horsegram: Local Toria: Panchali , Bhavani		
	Medium land Deep Sandy loam to Clay loam	Rice- Wheat-Greengram/ Rice –Vegetable/ Rice – Wheat	Rice-Wheat – Greengram/ Rice – Vegetable/ Rice – Wheat Rice: Rajendra Bhagawati, Rajendra Suwasni, Shusk Smrat Wheat: HD-2733, PBW-343, HP-1731 HD 2824 , K307 Greengram: PDM -84 -139, Pusa Vishal, SML -668 Cabbage – Golden Acre Pride of India Cauliflower- Patna early ,Hajipur early, Kuwan	▪ Full basal dose of NPK ▪ Life saving irrigation ▪ Application of Potash	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.
	Lowland Deep Sandy loam to clay loam	Rice – Wheat/ Rice – Wheat – Greengram/ Rice –Lentil/Chickpea Fallow – Lentil /Chickpea	Rice – Wheat Rice – Wheat – Greengram/ Rice – Lentil /Chickpea Rice: Sita , RM -1, Rajendra Suwasni, Rajendra Sweta Wheat: HD-2733, PBW-343, HP-1731 , HD 2824 , K-307 Lentil: DPL 62, PL639 Chickpea: C235 , P256	• Enhanced dose of nitrogen with full basal dose of NPK at transplanting • Old age rice seedling of 40-45 days may be used with four seedling per hill with close spacing	Seeds from BAU, Sabour, NSC, TDC, BRBN, KVK etc.

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

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**

Rice	• Life Saving irrigation • Drainage management • Retransplanting through Dapog nursery if needed • Gap filling • Resowing through drum seeder	• Life Saving Irrigation Drainage management • Subsequently crop if totally damaged i.e. Toria	• Drainage management • Subsequent crop if totally damaged • Harvest at physiological maturity	Storage at safer place
Maize	• Drainage management • Gap filling • Resowing, if completely damaged	• Drainage management • Alternative maize or other rabi crop if totally damaged	• Drainage management • Subsequent if totally damaged • Harvest at physiological maturity	Storage at safe place
Pigeonpea	• Drainage management • September sowing if Khrif Arhar is completely damaged • Gap filling if needed	• Drainage management • Alternative maize or other rabi crop if totally damaged	• Drainage management • Subsequent if totally damaged • Harvest at physiological maturity	Storage at safe place
Vegetable	• Resowing , if required • Replanting	• Drainage management	• Drainage management	Storage at safe place
Horticulture				
Mango	• Drainage management • Replanting if completely damaged • Gap filling	• Drainage management	• Drenching with copper fungicides • Drainage management • Harvesting at proper maturity	
Litchi	• Drainage management • Replanting if completely damaged • Gap filling			
Banana	• Drainage management • Replanting, if completely damaged	• Drainage management	• Drainage management • Spray and pasting of trunk	
Papaya	• Drainage management • Replanting, if completely damaged	• Drainage management	• Drainage management • Spray and pasting of trunk	

Heavy rainfall with high speed winds in a short span[2]				
Rice	• Drainage management • Replanting if completely damaged • Gap filling if needed	• Drainage management • Subsequent crop if totally damaged i.e. Toria	• Drainage management • Subsequent crop if totally damaged	Storage at safe place
Maize	• Resowing if completely damaged • Gap filling if needed • Drainage management	• Drainage management • Alternative maize or other crop if totally damaged	• Drainage management • Subsequent crop if totally damaged	Storage at safe place
Pigeonpea	• Resowing if completely damaged • Gap filling if needed • Drainage management	• Drainage management • Alternative crop if totally damaged	• Drainage management • Alternative crop if totally damaged	Storage at safe place
Vegetable	▪ Drainage management ▪ Gap filling	• Drainage management	• Drainage management • Drenching with copper fungicide	Storage at safe place
Horticulture				
Mango	• Drainage management • Replanting if substantially damaged	• Drainage management • Drenching with copper fungicides	• Drainage management • Harvest at proper time	
	•	•	•	
Banana	• Drainage management • Replanting if substantially damaged	• Drainage management • Staking	• Drainage management • Harvest at proper time	
Guava	• Drainage management • Replanting if substantially damaged	• Drainage management • Drenching with copper fungicides	• Drainage management • Harvest at proper time	
Outbreak of pests and diseases due to unseasonal rains				
Rice	• Seedling treatment with	• Spray of specific	• Spray of specific pesticides	Storage at safe place

	Carbendazim + Imidachloprid • Spray of pesticides with adjuvant	pesticides with adjuvant • Drainage management	with adjuvant • Drainage management	
Maize	• Application of granular insecticides viz. Thimmet 10 G/Carbofuran 3G	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	Storage at safe place
Pigeonpea	• Use of pesticides	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	Storage at safe place
Vegetable	• Drainage management • Spraying of insecticide & fungicide	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	Safe storage & transportation
Horticulture				
Mango	• Spray of pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	
Banana	• Spray of pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	
Guava	• Spray of pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	• Spray of specific pesticides with adjuvant • Drainage management	

2.3 Floods : N A

Condition	**Suggested contingency measure[o]**			
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
	N A			

Horticulture	
Continuous submergence for more than 2 days[2]	
Horticulture	
Sea water intrusion[3] (NA)	

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[p]				
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 (Terminal heat)	
Horticulture				
Mango	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Litchi				
Papaya	Life saving irrigation	Life saving irrigation	Life saving irrigation	
Cold wave[q]				
Wheat		Irrigation, interculturing, mulching by weeds		
Maize		Irrigation, interculturing, mulching by weeds		
Mustard		Irrigation, interculturing, mulching by weeds		
Potato		Irrigation, interculturing, mulching by weeds		
Pulses		Irrigation, interculturing,		

		mulching by weeds		
Horticulture				
Bhendi		Irrigation, interculturing, mulching by weeds		
Brinjal		Irrigation, interculturing, mulching by weeds		
Chili		Irrigation, interculturing, mulching by weeds		
Tomato		Irrigation, interculturing, mulching by weeds		
Bottle gourd		Irrigation, interculturing, mulching by weeds		
Frost				
Wheat		Irrigation, interculturing, mulching by weeds		
Chickpea		Irrigation interculturing, mulching by weeds		
Pigeonpea		Irrigation interculturing, mulching by weeds		
Lentil		Irrigation interculturing, mulching by weeds		
Horticulture				
Bhendi	Treat the seeds in 0.2% solution of Dithane M-45	Irrigation, interculturing, mulching by weeds		
Brinjal		Irrigation interculturing, mulching by weeds		
Chilli		Irrigation interculturing, mulching by weeds		
Tomato & Potato	Treat the seeds in 0.2% solution of Dithane M-45	Earthing up to 15cm height. Irrigation interculturing, mulching by weeds	Spray Dithane M-45/ Mancozeb @ 2.5 g/L of water in 3rd week of December at 10 days interval 3 times	Harvest in dry weather

Hailstorm		**NA**		
Horticulture	-	-	-	-
Cyclone	-	-	-	-
Horticulture	-	-	-	-

Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability			
Drinking water			
Health and disease management			
Drought			
Feed and fodder availability	Cultivation of fodder trees Storage of Improved Quality Fodder Conservation & Storage of Feed & Fodder Hay & Silage- Preserve the fodder in the form of hay from Berseem & other grasses as well as silage from (a) Maize- harvesting at well developed cob. (b) 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. Hay: –	Feeding of Complete Feed Block Feeding of Urea-Molasses Mineral-Block & Fodder Feeding of stored Hay/Silage/Improved Quality Fodder Feeding of Tree leaves some of which are as follows: 1. Bamboo leaves 2. Neem 3. Bargad 4. Peepal 5. Seesam 6. Subabul	Production of forage crops Balanced feeding of animal supported with little higher concentrate mixture Cultivation of fodder Rabi maize if water stagnated upto Nov/ December Jowar/Cowpea Maize in September

	• 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.		
Drinking water			
Health and disease management	Veterinary Preparedness with Medicines, Vaccines and provision for mobile ambulatory van. • Vaccination During drought stress becomes an incriminating factor for the precipitation of diseases in livestock and poultry. So, necessary vaccination of livestock and poultry should be done against economically important contagious disease. This will be helpful not only to check epidemic in animals, but also to reduce the probability of zoonoses in human beings. Care should be taken for mass vaccination of livestock and poultry with a view to covering 80% of livestock population in order to achieve herd immunity. Mass vaccination should be conducted by a team of Department staff with proper maintenance of detailed Inoculation Register. Pro-active steps should be taken to receive and stock the required doses of vaccines against different diseases for their use in face of Flood.	Animal safety, Health camp and Treatment Important Suggestions for animal and Poultry safety During drought, all efforts should be made to rescue most of the livestock and poultry as carefully as possible. 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. Do not tie animals together when releasing. Report the location, identification and disposition of livestock and poultry to authorities handling the disaster. **Health camp and treatment**	Sanitation, deworming, treatment, health camps Culling of Sick animals and disposal of carcass 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. **De-worming after the flood:** Immediately after drought, the animals like cattle, buffalo. Sheep, goat, pig, dog and poultry need to be de-wormed with suitable broad spectrum anthelmentics. This will enable the animals to regain proper health. **Treatment of sick animals:**

		Diseases that can occur during drought should be given special attention and accordingly medicines should be available in the health camp for the following mentioned diseases. **Treatment of Non infectious** Arrangement should be made for the treatment of drowning and traumatic injuries, aspiration pneumonia, lameness and other surgical cases in the health camp. **Disinfection of livestock premises and Poultry shed** Disinfection of livestock premises and the temporary sheds should be done with the help of bleaching powder, phenol, carbolic acid etc	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 drought. Carcasses of animals affected by the disease are the chief source of soil infection. They harbour the germs in large numbers and liberate them from both artificial and natural body openings into the surrounding soil. **Methods of Carcass disposal to be adopted** **Burial** **Burning** **Composting** **Vulturing** **s. Health Camp after the drought:** Protection of livestock from out breaking and communicable diseases be made. Health camps are to be organised in drought affected areas to restore the normal breeding capability of breedable population as well as to restore the normal health of livestock and poultry.

Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment			

management			
Health and disease management			

2.5.2 Poultry

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

	FMD Vaccine Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity **Pigs** Hemorrhagic Septicemia Vaccine PPR Vaccine FMD Vaccine Goat pox Vaccine Enterotoxemia Vaccine Anthrax Vaccine as per endemicity. **Poultry** Mareks disease vaccine RDV (F_1 & R_2B), FPV, IBRV & IBDV • **Medicines** • **Mobile Veterinary Clinics** Mobile Veterinary Clinics should be kept ready at Veterinary Hospital or Veterinary Camps so that immediate treatment of injured and affected animals may be done. .			
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				

Shelter/environment management				
Health and disease management				

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	(i) Thinning of population (ii) Arrangement of water supply from external resource	(i) Partial harvesting (ii) Addition of water (iii) Stocking of air breathing fishes	(i) Maintenances of remaining stock till favorable condition achieved (ii) If not feasible, total harvesting or transfer of fishes may be done. (iii) Preparation of the pond for next crop.
(ii) Impact of salt load build up in ponds / change in water quality	(i) Regular monitoring of water quality parameter. (ii) Arrangement of aeration (iii) Addition of water from external resource	(i) Arrangement of aeration. (ii) Addition of water • Monitoring of water quality • Reduction of manuring according to water level.	
(iii) Any other			
2) Floods			
A. Capture			
Marine			

Inland			
(i) No. of boats / nets/damaged			
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	(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,	Repairing/ arrangement of	A regular water on the flood	Re establishment of the infra

aerators, huts etc)	alternate safe place to keep pumps aerators etc.	and infrastructure facilities.	structural facility.
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			