State: Jharkhand

Agriculture Contingency Plan for the District: Dhanbad

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern plateau (chhotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau and Hills Region (VII)		
	Agro Climatic Zone (NARP)	Central And North Eastern Plateau Zone (BI-4)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Bokaro, Chatra, Deoghar, Dhanbad, Dumka, Giridh, Godda, Hazaribagh, Jamtara, Khunti, KOderma, Lohardaga, Pakur, Ramgarh, Sahebganj.		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		$23^0$79’	$86^0$43’	550-670 m.
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Research Centre, Dumka (Khoontabandh), (Birsa Agricultural University, Ranchi, Jharkhand.)		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Dhanbad, Baliapur Farm, (Birsa Agricultural University, Ranchi, Jharkhand.)		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	ZRS, Dumka		

1.2	**Rainfall**	**Normal RF (mm)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-Sep)	1070	2nd week of June	4th week of September
	NE Monsoon(Oct-Dec)	97		
	Winter (Jan- Feb)	67		
	Summer (Mar-May)	74		
	Annual	1308		

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)	204	87.5	19.8	49.1	0.57	11.3	3.2	32.6	30.8	19.8

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1.Stony and gravelly soils		
	2.Sandy soils		
	3.Loamy soils		
	4.Clay Soils		

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP)

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	37.7	110
	Area sown more than once	4.8	
	Gross cropped area	42.5	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	1.9		
	Gross irrigated area	2.3		
	Rainfed area			
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	1	7.0	
	Tanks	2165	9.6	
	Open wells	7040	8.6	
	Bore wells			
	Lift irrigation schemes	38	0..526	
	Micro-irrigation			
	Check dam & others	222	4.67	
	Total Irrigated Area	9731	31.6	
	Pump sets			

	No. of Tractors	200		
	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			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Paddy		52.8	52.8					52.8
	Maize		6.4	6.4					6.4
	Pigeonpea		4.0	4.0					4.0
	Finger millet		0.8	0.8					0.8
	Black gram		1.0	1.0					1.0
	Green gram		0.7	0.7					0.7
	Horse gram		1.3	1.3					1.3
	Sesame		0.35	0.35					0.35
	Wheat	4.2							4.2
	Maize	1.5							1.5
	Chick pea		7.0						7.0
	Pea	1.5							1.5
	Mustard	4.0							4.0
	Linseed		2.5						2.5

	Horticulture crops - Fruits	**Total Area ('000 ha)**
	Mango	194
	Guava	168
	Banana	18
	Litchi	0.5
	Lemon	436
	Total	448
	Horticulture crops - Vegetables	
	Cauliflower	16.2
	Cabbage	768
	Potato	93
	Onion	907
	Tomato	1177
	Chillies	939
	Medicinal and Aromatic crops	
	Plantation crops	
	Eg., industrial pulpwood crops etc.	
	Fodder crops	
	Total fodder crop area	
	Grazing land	
	Sericulture etc	

1.8	**Livestock**	**Male**	**Female**	**Total**
	Non descriptive Cattle (local low yielding)	163000	120741	283741
	Improved cattle	20	353	373
	Crossbred cattle	92	9197	9289
	Non descriptive Buffaloes (local low yielding)	20204	15049	35253
	Descript Buffaloes	43	4540	4583
	Goat	80604	72194	152798
	Sheep	50203	45580	95783
	Others (Camel, Pig, Yak etc.)	42301	35603	77904
	Commercial dairy farms (Number)			

1.9	**Poultry**	**No. of farms**	**Total No. of birds**
	Commercial	1	15580
	Backyard		788544

1.10 **Fisheries** (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	5249	3	1797

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)	3568.6	2	45
	Jhinga	8.6		

1.11 Production and Productivity of major crops

1.11	Name of crop	**Kharif**		**Rabi**		**Summer**		**Total**		**Crop residue as fodder** (‘000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops identified based on total acreage)										
	Paddy		2120							
	Maize		870							
	Pigeon pea		410							
	Blackgram		202							
	Greengram		190							
	Groundnut		420							
	Sunflower		250							
	Horsegram		440							
	Sesame		240							
	Niger		210							
	Cotton		470							
	Finger millet		500							
	Wheat				1500					
	Maize				920					
	Chick pea				560					
	Pea				720					
	Lentil				350					
	Mustard				250					
	Other				350					
Major Horticultural crops (Crops be identified based on total acreage)										
	Cauliflower	25632	167							
	Cabbage	12288	16							

	Potato	918	9.8							
	Onion	18140	20							
	Tomato	23540	20							
	Okra	27076	14							
	Chillies	11268	18							

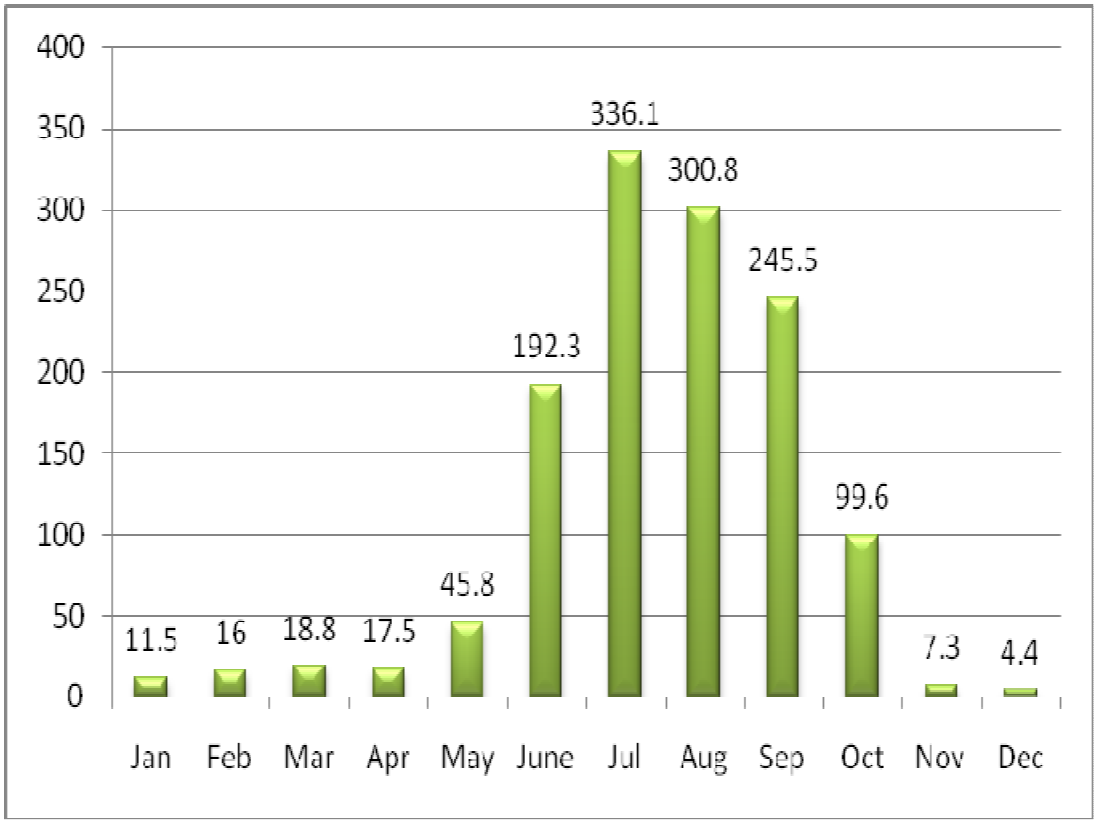
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Paddy**	**Pigeon pea**	**Horsegram**	**Wheat**	**Maize**
	Kharif- Rainfed	4th week of June to 4th week of July	3rd week of June to 2nd week of July	August		3rd week of June to 4th week of July
	Kharif-Irrigated	2nd week of June to 3rd week of June				
	Rabi-Rinfed					
	Rabi-Irrigated				November to December	

1.13	**What is the major contingency the district is prone to? (Tick mark)**	**Regular**	**Occasional**	**None**
	Drought	✓		
	Flood			✓
	Cyclone			✓
	Hail storm			✓
	Heat wave		✓	
	Cold wave		✓	
	Frost		✓	
	Sea water intrusion			✓
	Pests and disease outbreak		✓	

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

Annexure I

Annexure II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300
250
200
150
100
50
0
11.5
16
18.8
17.5
45.8
192.3
336.1
300.8
245.5
99.6
7.3
4.4
Jan
Feb
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May
June
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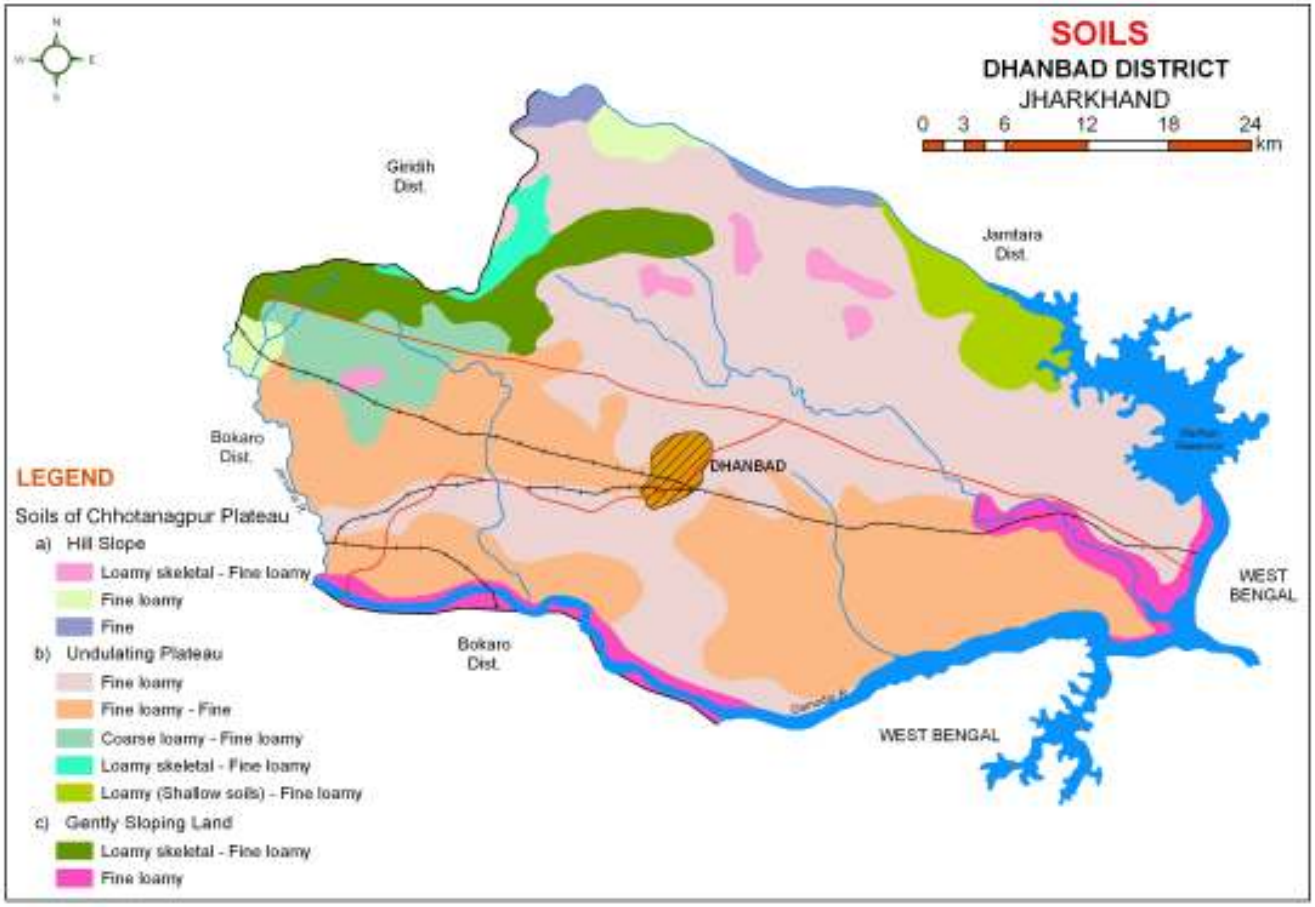
Sep
Oct
Nov
Dec

Annexure III



Source: NBSS& LUP, Kolkata

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks June 4th week	Upland rainfed sandy soils.	Direct sown rice (Gora) Pigeon pea (Bahar) Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram/Green gram Black gram/ Green gram Groundnut (AK12-24) Cucurbits/Ladyfinger	Direct sown rice (Vandana, Birsa Vikas dhan-109) Pigeon pea (Birsa Arhar-1, ICPH2671) Maize (Kanchan, Birsa Makai-1) Maize+ Ladyfinger Pigeon pea (Birsa Arhar-1) + Black gram (T-9/Pant U-19/Birsa urd-1) Black gram (T-9/Pant U-19/Birsa urd-1) + Green gram (Pusa Vishal) Groundnut (Birsa mungfali-2) Cucurbits/Ladyfinger/Cow pea / Dolichos Bean	Conservations Furrow Intercultivation Ridge sowing	

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

Delay by 4 weeks July 2nd week	Upland rainfed sandy soil	**Direct sown rice** (Vandana, Birsa Vikas dhan-109) **Pigeon pea** (Birsa Arhar-1, ICPH-2671) **Maize** (Kanchan, Birsa Makai-1) **Maize+ Ladyfinger** **Pigeon pea** (Birsa Arhar-1) + **Black gram** (T-9/Pant U-19/Birsa urd-1) **Black gram** (T-9/Pant U-19/Birsa urd-1) + **Green gram** (Pusa Vishal) **Groundnut** (Birsa mungfali-2) **Cucurbits/Ladyfinger/Cow pea /Dolichos Bean**	Continued up to July end	1. Sowing on Ridge for proper germination 2. Alternate row irrigation 3. Use micro irrigation system 4. Irrigation at only critical stage of crop	Supply of seed through NFSM & RKVY.

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

Delay by 6 weeks July 4th week	Upland rain fed sandy soil	**Direct sown rice** (Vandana, Birsa Vikas dhan-109) **Pigeon pea** (Birsa Arhar-1, ICPH2671) **Maize** (Kanchan, Birsa Makai-1) **Maize+ Ladyfinger** **Pigeon pea** (Birsa Arhar-1) + **Blackgram** (T-9/Pant U-19/Birsa urd-1) **Blackgram** (T-9/Pant U-19/Birsa urd-1) + **Green gram** (Pusa Vishal) **Groundnut** (Birsa mungfali-2) **Cucurbits/Ladyfinger/Cow pea /Dolichos Bean**	Continued up to July end **Pigeon pea + Horsegram** **Pigeon pea + Sesame** **French Bean** **Dolichos Bean** **Pigeon pea + Maize** **Pigeon pea** (UPAS-120) **Horse Gram** (Birsa Kulthi-1) **Sesame** (Kanke Safed, Krishna) **French Bean** (Swarna Priya, Arka Komal) **Dolichos Bean** (Swarna Utkrista)	**1.** Ridge Furrow method should be followed for proper germination **2.** Conservation of soil moisture. **3.** Mechanical weeding **4.** Staking for Dolichos Bean	**1**. Supply of seed through NFSM & RKVY. **2.** Supply of Grubber & Dutch Hoe.

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

Delay by 8 weeks August 2nd week	Upland rain fed sandy soil	Continued up to July end **Pigeonpea** + **Horse Gram** **Pigeonpea** + **Sesame** **French Bean** **Dolichos Bean** **Pigeon pea** + **Maize** **Pigeon pea** (UPAS-120) **Horse Gram** (Birsa Kulthi-1) **Sesame** (Kanke Safed, Krishna) **French Bean** (Swarna Priya, Arka Komal) **Dolichos Bean** (Swarna Utkrista)	**Pigeonpea** + **Horse Gram** **Pigeonpea** + **Sesame** **Pigeonpea** (UPAS-120) **Horsegram** (Birsa Kulthi-1) **Niger** (Birsa Niger-1, 2) **Sesame** (Kanke Safed, TC-25) **French Bean** (Swarna Priya, Arka Komal) **Tomato** (Arka Abha, Swarna Sampada, Swarna Vijay) **Brinjal** (Swarna Pratibha, Swarna Ajay, Swarna Sobha, Swarna Abhilamb, Swarna Nilima) **Cauliflower** (Early Kuwari) **Radish** (Japanese White) **Sweet Potato** (Kalmegh)	1. Sowing in Ridge furrow system 2. Irrigation in alternate row. 3. Conserve soil moisture. 4. Mechanical weeding. 5. Micro irrigation system.	1. Supply of seed through NFSM & RKVY. 2. Supply of Grubber & Dutch Hoe.

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system[c] including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks June 4th week	Medium land rainfed loamy soils.	**Paddy** (Lalat, IR-64, IR-36, Arize-6444)	**Paddy** (IR-64, IR-36, Lalat, Naveen, Sahbhagi, Arize-6444, Birsamati))	Paddy cultivation through SRI method or plastic drum seeder. 2. Bunding for water retention. 3. Use of cono weeder for weeding.	Supply of plastic drum seeder, SRI marker & cono weeder through NFSM & RKVY

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

Delay by 4 weeks July 2nd week	Medium land rainfed loamy soils.	**Paddy** (IR-36, IR-64, Lalat, Birsamati, Naveen, Arise-6444, Sahbhagi)	Continued up to July end.	1. Sowing through plastic drum seeder & transplanting by SRI method. 2. Bunding for water retention. 3. Use of cono weeder for weeding.	Supply of plastic drum seeder, cono weeder & SRI marker by NFSM & RKVY.

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks **July 4th week**	Medium land rainfed loamy soils.	**Paddy** – IR-36, IR-64, Lalat, Naveen, Birsamati, Arise 6444, Sahbhagi	Continued up to July end.	1. Sowing through plastic drum seeder and transplanting through SRI method. 2. Bunding for water retention. 3. Use of cono weeder for weeding.	Plastic drum seeder & for SRI method cono weeder marker can be supplied by NFSM & RKVY scheme.

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

Delay by 8 weeks August 2nd week	Medium land rainfed loamy soils.	**Paddy** – (IR-64, IR-36, Naveen, Lalat) or field left fallow. **Maize** – HQPM-1, Swarna Composite-1 **Pigeon pea** – Bahar, Birsa Arhar-1 **Urd** – T-9, Pant U-19, Birsa Urd-1 **Moong** – K-85, Pusa Vishal **Kulthi** – Birsa Kulthi-1 **Brinjal** **French Bean** **Tomato** **Rice Bean** **Sweet Potato** **Radish** **Cauliflower** **Chilies**	**Direct sowing of rice** – Anjali, Vandana, Birsa Dhan-108, Sahabhagi. **Maize** – HQPM-1, Suwan Composite-1, **Pigeon pea** –Birsa Arhar-1 /UPAS-120. **Black gram** – T-9, Pant U-19 **Green gram** – K-85, Pusa Vishal **Horse gram** – Birsa Kulthi-1 **Brinjal** – Swarna Pratibha, Swarna Abhilamb, Swarna Ajay, Swarna Sobha, Swarna Nilima. **French Bean –** Swarna Priya, Arka Komal, Swarna Lata) **Tomato –** Arka Abha, Swarna Sampada, Swarna Vijay. **Rice Bean** – RBL-1. **Sweet Potato –** Kalmegh. **Radish –** Japaneese White. **Cauliflower –** Early Kunwari, Hajipur extra early. **Chilies –** Pusa Jwala, Capsicum Bharat, Indra**.**	**1.** Sowing with fertilizer cum seeddrill. **2**. Sowing in Ridges **3.** Proper drainage channel **4.** Bunding of field in paddy fields. **5.** Sowing of rice across the slope. **6**. Sowing of pulses along the slope.	Seed cum fertilizer drill supplied by NFSM & RKVY scheme.

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **June 4th week**	Low land rainfed clay soils.	**Paddy** (MTU-7029, Sita, BPT-5204)	**Paddy** (Rajshree, Arise-6444, MTU-7029)	1. Direct sowing of rice. 2. Sowing through drum seeder. 3. Proper bunding for water retention. 4. Spreading of a layer of organic materials like straw, seedless grass, dry leaves etc in the field to check evaporation of water.	Supply of SRI marker, cono weeder & plastic drum seeder through NFSM & RKVY.

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks **July 2nd week**	Low land rainfed clay soils.	**Paddy** (MTU-7029, Arise-6444, Rajshree)	**Paddy** (Arise-6444, Rajshree)	1. Direct sowing of rice. 2. Sowing through drum seeder. 3. Proper bunding for water retention. 4. Spreading of a layer of organic materials like straw, seedless grass, dry leaves etc in the field to check evaporation of water.	1. SRI marker and cono weeder under NFSM & RKVY.

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks **July 4th week**	Low land rainfed clay soils.	**Paddy** (Arise-6444, Rajshree)	**Paddy** (Lalat, Naveen, Birsamati, IR-64, IR-36)	1. Direct sowing of rice. 2. Sowing through drum seeder. 3. Proper bunding for water retention. 4. Spreading of a layer of organic materials like straw, seedless grass, dry leaves etc in the field to check evaporation of water.	Supply of SRI marker, cono weeder and drum kit through NFSM & RKVY.

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks August 2nd week.	Low land rainfed clay soils.	**Rice** (Lalat, Naveen, Birsamati, IR-64, IR-36)	**Rice** (Anjali, Birsa Dhan-201, Birsa Dhan-202, Vandana, Sahbhagi).	1. Direct sowing of rice. 2. Sowing through drum seeder. 3. Proper bunding for water retention. 4. Spreading of a layer of organic materials like straw, seedless grass, dry leaves etc in the field to check evaporation of water. 5. Life saving irrigation.	Supply of seed & drum seeder through NFSM & RKVY.

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Upland rainfed sandy soils.	Direct sown rice (Gora) Pigeon pea (Bahar) Pigeon pea + Maize Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram / Greengram Blackgram Greengram Groundnut (AK12-24) Cucurbits/ladyfinger	1. Thinning and gap filling the existing crop. 2. Re sowing. 3. Inter culturing to check evaporation. 4. Strip cropping if re sown crops, 5. Life saving irrigation 6. Trench (1-1 ½ ft) making across the slope after 10 – 12 feet intervals.	1. Intercultivation 2. Conservation furrow 3. Thinning 4. Spray of anti transpirant.	1. Supply of inter cultural implements through RKVY. 2. Seeds supplied through NFSM & RKVY.

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At vegetative stage	Upland rainfed sandy soils.	Direct sown rice (Gora) Pigeon pea (Bahar) Pigeon pea + Maize Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram /Green gram Black gram Green gram Groundnut (AK12-24) Cucurbits/ladyfinger	1. Thinning 2. Weeding. 3. Clipping of leaf tips. 4. Postponement of top dressing 5. Life saving irrigation 6. Earthing up in groundnut. 7. Maize & Pigeon pea.	1. Intercultivation (soil mulching) 2. Conservation furrow 3. Spray of anti transpirants.	1. Supply of inter cultural implements through RKVY. 2. Farm ponds through NREGA..

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Upland rainfed sandy soils.	Direct sown rice (Gora) Pigeon pea (Bahar) Pigeon pea + Maize Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram /Green gram Black gram Green gram Groundnut (AK12-24) Cucurbits/ladyfinger	Life saving irrigation Postpone the top dressing.	Spray of anti transpirants.	Farm ponds through NREGA.

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
Terminal drought	Upland rainfed sandy soils.	Direct sown rice (Gora) Pigeon pea (Bahar) Pigeon pea + Maize Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram /Green gram Black gram Green gram Groundnut (AK12-24) Cucurbits/ladyfinger	Life saving irrigation Pigeon pea harvested for vegetable Harvest at physiological maturity stage.	Cow pea French Bean Irrigated vegetables- Potato, Cole crops, root crops etc. if irrigation source is available.	1. Farm pond through NREGA. 2. Threshing implements through RKVY. 3. Groundnut digger and plucker through RKVY.

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Medium land rainfed loamy soils	**Paddy** (Lalat, IR-64, IR-36, Arise-6444)	1. Re sowing or re-transplanting through plastic drum seeder. 2. Life saving irrigation may be given if possible. 3. Replacement of crop with short duration leguminous crop like Green gram, Black gram, Horse gram, Sesame & Niger. **Green gram** (Pusa Vishal) **Black gram** (Pant U-19, Birsa Urd-1) **Horse gram** (Birsa Kulthi-1) **Sesame** (Kanke Safed, TC-25) **Niger** (Birsa Niger-1,2)	1. Weeding 2. Postponement of top dressing 3. To check evaporation from field spread dried leaves (Mulching). 4. Proper bunding 5. Strip cropping of re sown crops 6. Spray of anti transpirants.	Supply of SRI marker and cono weeder from NFSM of RKVY scheme.

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

At vegetative stage	Medium land rainfed loamy soils.	Paddy (Lalat, IR-64, IR-36, Arize-6444)	1. Re sowing or re-transplanting through plastic drum seeder. 2. Life saving irrigation may be given if possible. 3. Replacement of crop with short duration leguminous crop like Greengram, Black gram, Horse gram, Sesame & Niger. **Green gram** (Pusa Vishal) **Black gram** (Pant U-19, Birsa Urd-1) **Horse gram** (Birsa Kulthi-1) **Sesame** (Kanke Safed, TC-25) **Niger** (Birsa Niger-1,2)	1. Weeding 2. Postponement of top dressing 3. To check evaporation from field spread dried leaves (Mulching). 4. Proper bunding 5. Strip cropping of re sown crops 6. Spray of anti transpirants.	Supply of SRI marker and cono weeder from NFSM of RKVY scheme.

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Medium land rainfed loamy soils.	**Paddy** (Lalat, IR-64, IR-36, Arise-6444)	1. life saving irrigation if available. 2. Sowing of early Rabi crops like Mustard/Linseed/ Lentil/Pea. 3. Postpone of top dressing. **Mustard** (Shivani) **Linseed** (T-397, Sweta) **Lentil** (PL-406, 639) **Pea** (Swarna Rekha)	1. Spray of anti transpirants.	Supply of anti transpirants through NFSM and RKVY.

Condition			**Suggested Contingency measures**

Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
Terminal drought	Medium land with loamy soils.	**Paddy** – Naveen, IR-36, IR-64, Lalat, Birsamati.	**1.** Harvest at physiological maturity stage. 2. Life saving irrigation.	**Chick pea – (**Pant G-114, Radhey, BG-256, KPG-59. **Pea** – (Swarna Rekha/Arkel) **Linseed** – Sweta/T-397) **Lentil** – (PL-406, PL-639). **Mustard** – (Shivani)	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Low land rainfed clay soils.	**Paddy** (MTU-7029, Sita, BPT-5204, Arise-6444)	1. Life saving irrigation may be applied if any water resource is available. 2. Gap filling should be done. 3. Re sowing or re transplanting through plastic drum seeder or SRI method respectively if heavy damage is occurs.	1. Weeding mulching. 2. Spreading a layer of dried leaves to check evaporation loss. 3. Proper bunding for water retention.	Supply of seeds, SRI marker & cono weeder and drum seeder through NFSM & RKVY.

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

At vegetative stage	Low land rainfed clay soils.	**Paddy** (MTU-7029, Sita, BPT-5204, Arise-6444)	1. Life saving irrigation. 2. Re sowing or re transplanting through drum seeder or SRI methods respectively.	1. Weeding mulching 2. Spraying a layer of dried leaves to check evaporation. 3. Postponement of top dressing. 4. Proper bunding of field.	Supply of SRI marker & cono weeder, plastic drum seeder and seeds through NFSM & RKVY.

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Low land rainfed clay soils.	**Paddy** (MTU-7029, Sita, BPT-5204, Arise-6444)	1. Life saving irrigation. 2. Sowing of early Rabi crops.	1. Spraying of anti transpirants. 2. Postponement of top dressing.	Supply of anti transpirant through NFSM & RKVY.

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
Terminal drought	Low land rainfed clay soils.	**Paddy** (MTU-7029, Sita, BPT-5204, Arise-6444)	1. Life saving irrigation. 2. Harvesting at physiological maturity stage.	**Chick pea** (Pant G-114) **Linseed** (T-397) **Wheat** (C-306, K-8962, DL-788-2) **Barley** (Ratna)	**1.** Farm pond through NREGA. 2. Threshing implements through RKVY.

2.1.2 Drought - Irrigated situation

Condition			**Suggested Contingency measures**

	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall					
Limited release of water in canals due to low rainfall					
Non release of water in canals under delayed onset of monsoon in catchment					
Lack of inflows into tanks due to insufficient /delayed onset of monsoon					

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Rainfed upland sandy soils.	Upland rice, Maize, Pigeon pea, Black gram, Green gram, Groundnut, Cucurbits, Ladyfinger.	Short duration pulses, oilseeds and vegetables (Green gram, Black gram, Sesame, Horse gram and Cucurbits)	1. Strip cropping. 2. Limited irrigation. 3. Alternate furrow irrigation. 4. Drip irrigation. 5. Micro tube irrigation. 6. Polythene mulching in vegetables.	Seed, irrigation system and polythene sheets through NFSM, NHM and RKVY. Check dam, pond through NREGA.
	Rainfed medium land loamy soils.	**Paddy** (Lalat, IR-64, IR-36, Arise-6444)	Short duration rice varieties (Vandana, Anjali, BVD-110,109)	1. Limited irrigation. 2. Sowing across the slope. 3. Trench (1-1 ½ ft.) across the slope. 4. Contour bunding.	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
	Rainfed low land clay soils.	**Paddy** (MTU-7029, BPT-5204, Rajshree, Sita)	Medium duration paddy varieties (Lalat, IR-64, IR-36, Arize-6444)	1. Life saving irrigation. 2. Spray of anti transpirant.	

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]**
Direct sown rice (Gora) Pigeon pea (Bahar) Maize (Kanchan) Maize + Ladyfinger Pigeon pea +Black gram/Green gram Black gram/ Green gram Groundnut (AK12-24) Cucurbits/Ladyfinger	Provide drainage	Provide drainage	Drain out excess water, Harvesting at physiological maturity stage. Harvest of Pigeon pea, Cow pea, French Bean for vegetable purpose.	Shift to safe place. Dry in shade & turn frequently. Safe storage against storage pest & disease.
Heavy rainfall with high speed winds in a short span[2]				
Outbreak of pests and diseases due to unseasonal rains				

2.3 Floods

Condition	Suggested contingency measure			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days[2]	Not applicable			
Sea water intrusion[3]				

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

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Hailstorm	Not applicable			
Heat Wave				
Wheat	Life saving irrigation	Life saving irrigation	Life saving irrigation (Terminal heat)	
Cold wave				
Wheat	Irrigation Balanced fertilizer application Foliar spray of nutrients	Light irrigation Mulching with crop residue \ weeds Fertilizer application	Irrigation, fertilizer application	
Vegetables	Raising of seedling in Poly house, re sowing if damaged	Light irrigation Mulching with crop residue \ weeds Disease and pest control, care for chilling injury or replanting	Quick harvesting	Grading, quick disposal for marketing
Pigeonpea		Light irrigation Mulching with crop residue\ weeds		
Frost				
Wheat		Light irrigation Mulching with crop residue\ weeds		
Pigeonpea	Exposure of crop to smoke by burning waste material during night time	Exposure of crop to smoke by burning waste material during night time Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time Light sprinkler irrigation	Exposure of crop to smoke by burning waste material during night time
Tomato & Potato		Earth up to 15cm ht. Irrigation Intercultivation, Mulching with weeds		Harvest in dry weather
Horticultural crops	Light frequent irrigation may be practiced wherever irrigation facilities are available, mulching, thatching and creating smoke			

	screens and lighting of fire is also practiced where irrigation facilities are not available
Cyclone	Not applicable

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
Drought			
Feed and fodder availability	Preservation of surplus fodder, encourage fodder cultivation and tree plantation and also encourage supply of molasses to cattle feed plants.	Arrangement of feeds and fodder from adjoining areas, exploitation of non conventional feed resources, use of urea treated straw and feed blocks.	Promotion of fodder seed production, cultivation and storage, establishment of fodder block making machines in fodder surplus areas.
Drinking water	Repairs of tube wells, clear off the sludge in the canals and local water catchments and clean the water tanks, large ponds and lakes	Harnessing water through the existing reservoirs and exploitation of groundwater.	To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season.
Health and disease management	Mass vaccination and de worming	Provide shades to animals and water as much as possible. Treatment of diseased animals and proper disposal of carcasses.	Treatment of diseased animals and provide vitamin and mineral supplement to regain strength and vigour.

[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				
Shortage of feed ingredients	Storage of feed	Provide non conventional feed, supplement anti oxidant and anti stress		
Drinking water	Storage of water in tanks	Add vit-C and other anti stress ingredients with water		
Health and disease	Regular vaccination	Vaccination and treatment of	Disposal of dead birds	

management		diseased one		

[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			
Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Plough the pond and apply lime @ 250kg/ha	Reduce the stocking density from 25000 fry (1 inches size) to 10000-15000/ha	Remove the fishes of bigger size(0.5 kg)
(ii) Impact of salt load build up in ponds / change in water quality		Apply lime @ 50 kg on every 15-30 days. Aerate the water as per need	Apply lime as per need @ 50 kg/ha
2. Heat wave and cold wave			
Aquaculture			
(i) Changes in pond environment (water quality)	Reduce application of organic manure and supplementary feeds	Reduce/stop application of feed	Harvest the bigger fishes, reduce/stop application of supplementary feed. Apply lime @ 50 kg/ha and potassium permanganate in perforated plastic ball 5-10g in each ball
(ii) Health and Disease management	Apply lime	Apply lime/salt as per need	Apply lime/salt as per need.

[a] based on forewarning wherever available