

Agriculture Contingency Plan for District: Mungeli

State: CHHATTISGARH

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	11.0 Chhattisgarh/Mahanadi Basin Agro-eco region J3 (Cd/Cm)5		
	Agro-Climatic Zone (Planning Commission)	Zone-7 Eastern plateau and hills region		
	Agro Climatic Zone (NARP)	Chhattisgarh plain zone		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Raipur, Baloda bazaar, Gariyabandh, Bilaspur, Korba, Raigarh, Janjgir-champa, Kabirdham, Rajnandgaon, Durg, balod, bemetara, Dhamtari, Mahasamund, Korba (15 districts)		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		22.06 N	81.68 E	287 Meters
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Sarkanda, Bilaspur, C.G.		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Sarkanda, Bilaspur (C.G.)		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Department of Agrometeorology, College of Agriculture, IGKV, Raipur (C.G.)			

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):	1007.8	55	17 June 25 th SMW, June	30 September 39 th SMW, September
	NE Monsoon(Oct-Dec):	80.1	5	Post monsoon (October-December)	-
	Winter (Jan- March)	40.2	5	Winter rains	-
	Summer (Apr-May)	36.2	3	-	-
	Annual	1164.6	68	-	-

Source: Agricultural Statistics 2013, Commissioner land records, Raipur, Govt. of Chhattisgarh

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)	275.0	208.0	1.9	11.6	17.6		0.01	0.2	1.5	2.6

Source: Agricultural Statistics, 2013, Commissioner of land records, Raipur, Govt. of Chhattisgarh

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	1. Entisol (Bhata-gravely)	-	-
	2. Inceptisol (Matasi-Sandyloam)	-	-
	3. Alfisols (Dorsa-clayloam)	-	-
	4. Vertisols (Kanhar-clayey)	-	-
	5. Vertisols unbanded (Bharri)	-	-
	Total	-	-
	Others (specify):	-	-

* 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)

Source: Agricultural Statistics 2013, Commissioner land records, Raipur, Govt. of Chhattisgarh

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	127.9	162
	Area sown more than once	80.1	
	Gross cropped area	208.0	

1.6	Irrigation	Area ('000 ha)
	Net irrigated area	60.987
	Gross irrigated area	68.467

Rainfed area	139.54		
Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
Canals	33	51.432	
Tanks	1384	0.040	
Open wells	886	0.431	
Bore wells	6490	16.491	
Lift irrigation schemes			
Micro-irrigation			
Other sources (please specify)			
Total Irrigated Area		68.394	
Pump sets	4052		
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	Nil		
Critical	Nil		
Semi- critical	Nil		
Safe	9	100	
Wastewater availability and use	Nil		

Ground water quality	Potable and suitable for irrigation as well
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%	

Source: Agricultural Statistics, 2013, Commissioner of land records, Govt. of Chhattisgarh

1.7 Area under major field crops & horticulture (as per latest figures) (2013)

1.7	S.No.	Major field crops cultivated	Area ('000 ha)							
			<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
			Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
1	Rice	600.986	47.934	108.920	-	-	-	-	108.920	
2	Wheat	-	-	-	2.841	2.893	5.734	-	5.734	
3	Jowar	-	0.001	0.001	-	-	-	-	0.001	
4	Maize	-	0.201	0.201	-	-	-	-	0.201	
5	Millets	-	0.667	0.667	-	-	-	-	0.667	
6.	Total Cereals	-	-	-	-	-	-	-	115.524	
7.	Pigeonpea	-	1.745	1.745	-	-	-	-	1.745	
8.	Gram	-	-	-	15.808	-	15.808	-	15.808	
9.	GreenGram	-	0.019	0.019	0.002	-	0.002	-	0.021	
10.	BlackGram	-	0.087		0.041	-	0.041	-	0.128	
11.	HorseGram	-	0	0	-	-	-	-	0	
12.	Pea	-	-	-	0.246	-	0.246	-	0.246	
13.	Lentil	-	-	-	-	0.843	0.843	-	0.843	
14.	Lathyrus	-	-	-	-	62.985	62.985	-	62.985	
15.	Total Pulses	-	-	-	-	-	-	-	81.901	
16.	Rapeseed-mustard	-	-	-	-	0.042	-	-	0.042	
17.	Linseed	-	-	-	-	0.345	-	-	0.345	
18.	Groundnut	-	0.759	0.759	-	-	-	-	0.759	
19.	Sesame	-	0.056	0.056	-	-	-	-	0.056	
20.	Soybean	-	5.386	5.386	-	-	-	-	5.386	
21.	Sunflower	-	-	-	-	-	-	-		
22.	Safflower	-	-	-	-	0.134	-	-	0.134	
23	Niger	-	-	-	-	0	-	-	0	

24.	Total Oilseeds	-	-	-	-	-	-	-	6.449
25.	Vegetables	-	-	-	-	-	-	-	2.182
26.	Sugarcane	-	-	0.399	-	-	-	-	0.399
27	All Crops	-	-	-	-	-	-	-	

Source: Agricultural Statistics, 2009, Commissioner of land records, Govt. of Chhattisgarh

S.No.	Horticulture crops - Fruits	Area (' 000 ha)		
		Total	Irrigated	Rainfed
1	Mango	0.202	-	-
2	Banana	0.012	-	-
3	Papaya	0	-	-
4	Gauva	0.264	-	-
5	Lemon	-	-	-
6	Jack Fruit	-	-	-
7	Custard Apple	-	-	-
8	Others	-	-	-
Total	All fruits	0.493	-	-
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
1	Cauliflower	0.095	0.095	-
2	Cabbage	0.059	0.059	-
3	Brinjal	0.410	0.410	-
4	Tomato	0.455	0.455	-
5	Bhendi	0.415	0.415	-
6	Potato	0.123	0.123	-
7	Cowpea	-	-	-
8	Leafy Vegetables	-	-	-
9.	Arbi	0.008	0.008	-
12	Others	0.380	0.380	-
13	Spices	0.671	-	-
14.	All vegetables	2.182	-	-

Source: Directorate of Horticulture, Govt. of Chhattisgarh

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

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 m t)	Productivity (kg/ha)	Production ('000 m t)	Productivity (kg/ha)	Production ('000 m t)	Productivity (kg/ha)	Production ('000 m t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
Crop 1	Rice	245.868	2258	-	-	-	-	245.868	2257	-
Crop 2	Black Gram	0.032	250	-	-	-	-	0.032	250	-
Crop 3	Maize	0.357	1826	-	-	-	-	0.357	1826	-
Crop 4	Pigeonpea	1.150	666	-	-	-	-	1.150	666	-
Crop 5	Groundnut	0.965	1272	-	-	-	-	0.965	1272	-
Crop 6	Wheat	-	-	8.276	1443	-	-	8.276	1444	-
Crop 7	Lathyrus	-	-	35.456	563	-	-	35.456	563	-
Crop 8	Linseed	-	-	0.144	418	-	-	0.144	418	-
Crop 9	Gram	-	-	19.975	1264	-	-	19.975	1264	-
Crop 10	Soybean	9.344	1588	-	-	-	-	9.344	1588	-
	All crops	257.716		63.851		-	-	321.567		-
Major Horticultural crops (Crops to be identified based on total acreage) – Fruits & Vegetables										
Crop 1	Spices	-	-	-	-	-	-	44.603	-	-
Crop 2	Cabbage	-	-	-	-	-	-	17.641	-	-
Crop 3	Cowpea	-	-	-	-	-	-	21.302	-	-

Source: Agricultural Statistics, 2013, Commissioner of land records, Govt. of Chhattisgarh

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Black gram	Maize	Pigeon pea	Ground nut
	Kharif- Rainfed	17 June - 05 July	20 June - 30 June	20 June - 05 July	25 June - 15 July	20 June - 30 June
	Kharif-Irrigated	05 June - 15 June	-	15 April - 30 April	-	-
		Lathyrus	Gram	Wheat	Summer Rice	Linseed

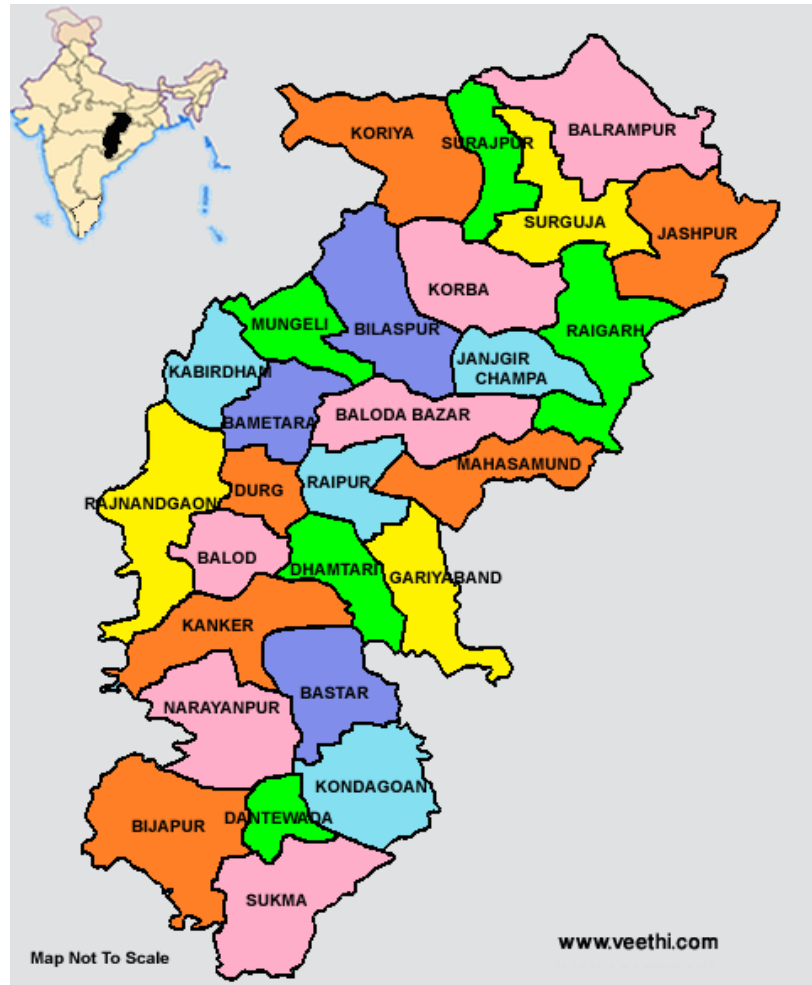
	Rabi- Rainfed	20 Oct- 30 Oct	25 Oct - 05 Nov	-	-	20 Oct - 30 Oct
	Rabi-Irrigated	-	15 Nov - 30 Nov	20 Nov -05 Dec	25 Nov - 15 Dec	-

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	x	✓	x
	Flood	x	x	x
	Cyclone	x	x	x
	Hail storm	x	x	x
	Heat wave	x	✓	x
	Cold wave	x	✓	x
	Frost	x	x	x
	Sea water intrusion	x	x	x
	Pests and disease outbreak (specify) 1. Rice - Stem borer, WBPH, leaf hopper 2. Black gram - Yellow vein mosaic, hairy caterpillar 3. Pigeon pea - Pod borer complex, wilt 4. Groundnut - Tikka disease			
	Others (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
		Soil map as Annexure 3	Enclosed: No

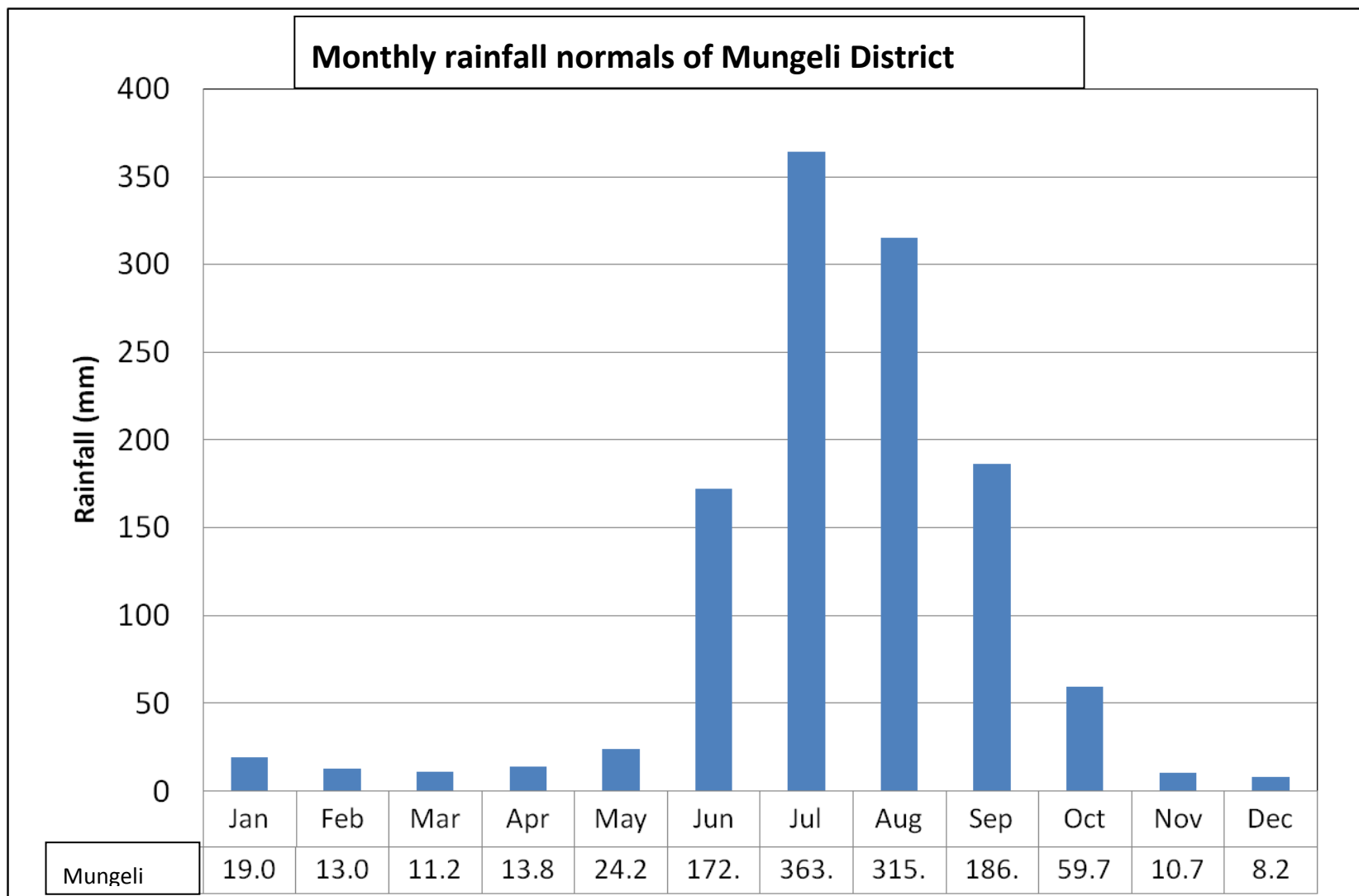
Annexure I

Location map of Mungeli district in Chhattisgarh state



Annexure 2

Average month-wise rainfall(mm) in Mungeli district



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks (July first week)* (REFER TO THE MATRIX TABLE)	1) Farming situation: <i>Unbunded shallow light soils</i>	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	-	-	Line sowing
		Cropping system 2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)	-	-	Line sowing
		Cropping system 3: Oilseeds	-	-	Line sowing
			-	-	
			-	-	-
			-	-	-
	2) Farming situation: <i>Unbunded sloppy black soils</i>	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	-	-	Line sowing
		Cropping system 2: Soybean	-	-	Line sowing
		Cropping system 3: Pigeon pea	-	-	Line sowing

		(ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 4: Sesame	-	-	Provide drainage
	3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	-	Transplanting method	-
	4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	-	Transplanting method	-
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 4 weeks (July third week)	1) Farming situation: Unbunded shallow light soils	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	Short-duration variety	Higher seed rate	Line sowing
		Cropping system 2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)	Short-duration variety	Higher seed rate	Line sowing
		Cropping system3: Oilseeds	Short-duration variety	Higher seed rate	Line sowing

	2) Farming situation: Unbanded sloppy black soils	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Anjali, Kalinga 3, Vandana, Danteshwari, Poornima	Higher seed rate	Line sowing
		Cropping system 2: Soybean	Short-duration variety	Higher seed rate	Line sowing
		Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)	Short-duration variety	Higher seed rate	Line sowing
		Cropping system 4: Sesame	Short-duration variety	Higher seed rate	Line sowing
	3) Farming situation: Banded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Purnima, Danteshwari, Samleshwari, Annada	Sowing of pre-germinated seeds; closer transplanting with more no. of seedlings/hill	Puddled field; chopped the seedlings
	4) Farming situation: Banded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Sowing of pre-germinated seeds; closer transplanting with more no. of seedlings/hill	Puddled field; chopped the seedlings

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 (August first week)	1) Farming situation: Unbanded shallow light soils	Cropping system1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	Change the crop with niger	Normal seed rate	Line sowing
		Cropping system2: Pulses			

		Cropping system3: Oilseeds			
	2) Farming situation: Unbanded sloppy black soils	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Change the crops with either niger or short-duration green gram or black gram varieties		
		Cropping system 2: Soybean			
		Cropping system 3: Pigeon pea			
		Cropping system 4: Sesame	Short-duration varieties	Higher seed rate	Line sowing
	3) Farming situation: Banded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrasahni, Samleshwari	Sowing of pre-germinated seeds of short-duration varieties in puddled field	Higher seed rate	There should not be initial standing water column in puddled field
	4) Farming situation: Banded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Sowing of pre-germinated seeds of short-duration varieties in puddled field	Higher seed rate	There should not be initial standing water column in puddled field

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 8 weeks (August third week)	1) Farming situation: Unbanded shallow light soils	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-	Change the crop either with niger or horse gram	Normal seed rate	Line sowing

	30, NMH-803KMH-3426			
	Cropping system2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
	Cropping system 3: Oilseeds			
2) Farming situation: Unbunded sloppy black soils	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada Cropping system 2: Soybean Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan) Cropping system 4: Sesame	Change the crop either with niger or horse gram	Normal seed rate	Line sowing
3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Change the crop either with linseed, lathyrus, field pea or toria	Normal seed rate; line sowing in October-November	Provisions of adequate drainage during rainy season
4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Change the crop either with linseed, lathyrus, field pea or toria	Normal seed rate; line sowing in October-November	Provisions of adequate drainage during rainy season

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil, nutrient & moisture conservation measures	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.	1) Farming situation: <i>Unbunded shallow light soils</i>	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	Re-sowing with same variety	Addition of organic matters & adoption of soil & moisture conservation measures	Line sowing; higher seed rate
		Cropping system2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 3: Oilseeds			
		2) Farming situation: <i>Unbunded sloppy black soils</i>	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Re-sowing with same variety	Addition of organic matters & adoption of soil & moisture conservation measures
	Cropping system 2: Soybean				
	Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)				

		Cropping system 4: Sesame			
	3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Re-sowing with same variety both in main field & nursery	Repairing of field bunds	Line sowing; higher seed rate
	4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Re-sowing with same variety both in main field & nursery	Repairing of field bunds	Line sowing; higher seed rate

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	1) Farming situation: Unbunded shallow light soils	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	Weed control, thinning, partial leaf removal	Mulching, intercultural operations, foliar application of nutrients	
		Cropping system 2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12)			

		/ Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 3: Oilseeds			
	2) Farming situation: Unbunded sloppy black soils	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Weed control, thinning	Mulching, intercultural operations, foliar application of nutrients	
		Cropping system 2: Soybean	Weed control, thinning, partial leaf removal		
		Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 4: Sesame			
	3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Weed control, thinning	Mulching, intercultural operations, repairing of bunds, foliar application of nutrients	
	4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Weed control, thinning	Mulching, intercultural operations, repairing of bunds, foliar application of nutrients	

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	1) Farming situation: <i>Unbunded shallow light soils</i>	Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426	Weed control, thinning, partial leaf removal, life saving irrigation; if available	Mulching, intercultural operations, foliar application of nutrients	
		Cropping system 2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 3: Oilseeds			
	2) Farming situation: <i>Unbunded sloppy black soils</i>	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Weed control, thinning, life saving irrigation, if available	Mulching, intercultural operations, foliar application of nutrients	-
		Cropping system 2: Soybean			-
		Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)	Weed control, thinning, partial leaf removal, life saving irrigation; if available		-
		Cropping system 4: Sesame			-

	3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrasahni, Samleshwari	Weed control, thinning, life saving irrigation, if available	Mulching, intercultural operations, repairing of bunds, foliar application of nutrients	
	4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Weed control, thinning, life saving irrigation; if available	Mulching, intercultural operations, repairing of bunds, foliar application of nutrients	

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
	1) Farming situation: Unbunded shallow light soils	<p>Cropping system 1: Maize Maize- Hishell, P 3785, Bio 9681, 900M, Seedtech 2324, Pro 4640, DMH 117, Pro Agro- 4212 PEM 1 , VH - 9,17HQPM-1 NMH-731NK-30, NMH-803KMH-3426</p> <p>Cropping system 2: Pulses Mungbean (Pusa Vishal,HUM 1, HUM-16, BM 4, HUM 12) / Urdbean (TU 94-2, TAU-2, KU 96-3, Indira Urd 1) Pigeonpea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)</p> <p>Cropping system 3: Oilseeds</p>	Partial leaf removal, life saving irrigation	<i>Toria</i> after maize harvest	Harvest the crop at physiological maturity

	2) Farming situation: Unbunded sloppy black soils	Cropping system 1: Rice - Purnima, Danteshwari, Samleshwari, Annada	Life saving irrigation, if available	Plan for sowing of gram, linseed, field pea, safflower & vegetables etc.	Harvest the crop at physiological maturity , Sowing should be done after field preparation
		Cropping system 2: Soybean	Partial leaf removal, life saving irrigation		
		Cropping system 3: Pigeon pea (ICPL87, JKM189, UPAS 120, BDN 2, Rajivlochan)			
		Cropping system 4: Sesame			
	3) Farming situation: Bunded mid-land; heavy black soils	Cropping system 1: Rice - MTU1010, IR64, IR 36, Indira Barani Dhan 1, Chandrahasni, Samleshwari	Life saving irrigation, if available	Plan for sowing of gram, linseed, field pea, wheat, safflower etc.	Harvest the crop at physiological maturity
	4) Farming situation: Bunded low-lands; heavy black soils	Cropping system 1: Rice- Mahamaya, s swarna, Sampda, IGKV R1, IGKV R2, Bamleshwari, Indira Sona	Life saving irrigation , if available	Plan for sowing of gram, linseed, field pea, wheat, lathyrus (<i>utera</i>) etc.	Harvest the crop at physiological maturity

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Suggested Contingency measures			
		Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	1) Farming situation: Mid-land Alfisols	Rice-Rice	Rice-Gram/Sunflower/ Linseed	Use of higher seed rate	-
		Rice-Wheat	Rice-Gram/Sunflower/ Linseed	Use of higher seed rate	-
		Cropping system 3:			
	2) Farming situation: Lowland Vertisols	Rice-Rice	Rice-Gram/Sunflower/ Linseed	Use of higher seed rate	-
		Rice-Wheat	Rice-Gram/Sunflower/ Linseed	Drilling in lines, use of higher seed rate	-

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
		Cropping system 3:			
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	1) Farming situation: Mid-land Alfisols	Rice-Rice	Rice-Gram/Sunflower/Linseed	Drilling in lines, adoption of moisture conservation practices	-
		Rice-Wheat	Rice-Gram/Sunflower/Linseed	Drilling in lines, adoption of moisture conservation practices	-
		Cropping system 3:			
	2) Farming situation: Lowland Vertisols	Rice-Rice	Rice-Gram/Sunflower/Linseed	Drilling in lines, adoption of moisture conservation practices	-
		Rice-Wheat	Rice-Gram/Sunflower/Linseed	Drilling in lines, adoption of moisture conservation practices	-
		Cropping system 3:			
Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation: Mid-land Alfisols	Rice-Rice	Rice –Gram/ linseed/sunflower	Early sowing in <i>Rabi</i> & moisture conservation	-
		Rice-Wheat	Rice –Gram/ linseed/sunflower	Early sowing in <i>Rabi</i> & moisture conservation	-
		Cropping system 3:			
	2) Farming situation: Lowland Vertisols	Rice-Rice	Rice-Lathyrus	Relay cropping of Lathyrus	-
		Rice-Wheat	Rice-Lathyrus	Relay cropping of Lathyrus	-
		Cropping system 3:			
Lack of inflows into tanks due to	1) Farming situation: Mid-land	Rice-Rice	Rice –Gram/ linseed/sunflower	Early sowing in <i>Rabi</i> & moisture conservation	-

Condition	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Suggested Contingency measures		Remarks on Implementation
				Agronomic measures		
insufficient /delayed onset of monsoon	Alfisols	Rice-Wheat	Rice –Gram/ linseed/sunflower	Early sowing in <i>Rabi</i> & moisture conservation	-	
		Cropping system 3:				
	2) Farming situation: Lowland Vertisols	Rice-Rice	Rice-Lathyrus	Relay cropping of Lathyrus	-	
		Rice-Wheat	Rice-Lathyrus	Relay cropping of Lathyrus	-	
		Cropping system 3:				
	Insufficient groundwater recharge due to low rainfall	1) Farming situation: Mid-land Alfisols	Rice-Rice	Rice- Pulses/oilseeds	Early sowing in <i>Rabi</i> & moisture conservation	-
Rice-Wheat			Rice- Pulses/oilseeds	Early sowing in <i>Rabi</i> & moisture conservation	-	
Cropping system 3:			-	-	-	
2) Farming situation: Lowland Vertisols		Rice-Rice	Rice- Pulses/oilseeds	-	-	
		Rice-Wheat	Rice- Pulses/oilseeds	-	-	
		Cropping system 3:	-	-	-	

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				
Paddy	Provision of drainage; if rains are intense	Provision of drainage; if rains are intense	Provision of drainage; if rains are intense	Provision of drainage; if rains are intense
Pulses & oilseeds	Provision of drainage; if rains are intense			
Wheat	Provision of drainage; if rains are intense			
Horticulture				

(Vegetables)				
Tomato	Drain out-excess water & gap filling	Drain out-excess water and spray the plano fix @ 10 ppm to control the flower drop	Drain out-excess water staking the plants and picking the fruit	Drain out-excess water keep the produce in shed at higher elevation and cover with plastic sheets
Brinjal	Drain out-excess water & gap filling			
Bhendi	Drain out-excess water & gap filling			
Cauliflower	Drain out-excess water & gap filling			
Cabbage	Drain out-excess water & gap filling			
Fruits				
Mango	Drain out-excess water & gap filling	Drain out excess water and spray the planofix @ 10 ppm to control the flower drops	Drain out excess water and picking the fruits at pre-maturity stage	excess water keep the produce in shed at higher elevation & cover it with plastic sheet and fruits may the used for pickle, jam, jelly & as vegetable
Guava	Drain –out excess water & gap filling			
Citrus	Drain –out excess water & gap filling			
Papaya	Drain –out excess water & gap filling			
Banana	Drain –out excess water & gap filling			
Heavy rainfall with high speed winds in a short span²				
Paddy	Provision of drainage	Provision of drainage	drainage	drainage
Pulses & oilseeds	Provision of drainage	Provision of drainage	drainage	drainage
Crop3				
Crop4				
Crop5				
Horticulture				
Tomato	Drain out-excess water & gap filling & Staking the plants	Drain out-excess water and spray the plano fix @ 10 ppm to control the flower drop	Drain out-excess water	Drain out-excess water and keep the produce in shed at higher elevation and cover with plastic sheets
Brinjal				
Bhendi				
Cauli flower				

Cabbage				
Mango	Drain out-excess water & gap filling & Staking the plant	Drain out excess water and spray the planofix @ 10 ppm to control the flower drops	Drain out excess water and picking the fruits at pre-maturity stage & collect the fallen fruits	Drain out the excess water keep the produce in shed at higher elevation & cover it with plastic sheet and fruits may the used for pickle, jam, jelly & as vegetable
Guava				
Citrus				
Papaya				
Banana				

Outbreak of pests and diseases due to unseasonal rains				
Rice (rain fed)	Cut worm, army worm (swarming caterpillar) (i) Insect-pest monitoring(ii) clean cultivation in crop field along with bunds (iii) Collection and destruction of egg mass (iv) Soil trenching/mechanical barrier all along the infested fields (iv) Use of chlorpyriphos/fenvalerate dusts @ 20-25 kg/ha.	Gundhi bug (i) Spray of chlorpyriphos/malathion @ 02 ml./lr. on the inested crop	Army worm (i) Field flooding with water (i) Spraying of mixture of malathion (01 ml/lr) and dichlorovos (0.5 ml/lr).	-
Rice (transplanted)	Cut worm, army worm (swarming caterpillar) (i) Insect-pest monitoring(ii) clean cultivation in crop field along with bunds (iii) Collection and destruction of egg mass (iv) Soil trenching/mechanical barrier all along the infested fields (iv) Use of chlorpyriphos/fenvalerate dusts @ 20-25 kg/ha.	Gundhi bug (i) Spray of chlorpyriphos/malathion @ 02 ml./lr. on the inested crop	Army worm (i) Field flooding with water (i) Spraying of mixture of malathion (01 ml/lr) and dichlorovos (0.5 ml/lr).	-
Soybean	Foliage feeders (larval pest) (i)Weekly collection and destruction of egg masses and tiny larvae along with the leaves (ii) Spraying of Triazophos @ 2 ml./lr of water	Foliage feeders (larval pest) (i)Weekly collection and destruction of egg masses and tiny larvae along with the leaves (ii) Spraying of Triazophos @ 2	-	-

		ml./lr of water		
Maize	Stem borer (i) collection and destruction of dead hearts along with larva (ii) Use of carbofuran 4 – 5 granules in the each leaf whorl	-	-	-
Pigeon pea	Jassid and foliage feeding insects (i) spraying of monocrotophos @ 1.11 ml./lr. of water.	Pod borer complex (i) weeklt collection and destruction of larvae(ii) use of pheromone trap against <i>H. armigera</i> .(iii) Spraying of Triazophos @ 2 ml./lr or quinalphos @ 02ml. of water	-	-
Groundnut	Jassid and foliage feeding insects (i) spraying of monocrotophos @ 1.11 ml./lr. of water.	-	-	-
Sesame	Jassid and foliage feeding insects (i) spraying of monocrotophos @ 1.11 ml./lr. of water.			
Moong/urd	White fly (i) Acetamepid @ 0.20 g/lr or dimethate @ 1ml./lr. of water.			
Horticulture				
Tomato	Drain out excess water Drenching with fungicide to control wilt & damping off.	Drain out-excess water and spray the plano fix @ 10 ppm to control the flower drop	Drain out-excess water and drenching with fungicide to control wilt	NIL
Brinjal				
Bhendi				
Cauli flower				
Cabbage				
Fruit Crops				
Mango	Drain out-excess water Drenching with	Drain out-excess water Spray 0.2	Drain out excess	NIL

Guava	fungicide to control rotting	% wt sulphur powder to control powdery mildew, Spray 0.5 % copper oxy chloride to control citrus canker in citrus spp	water and picking the fruits at pre-maturity stage	
Citrus				
Papaya				
Banana				

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation¹				
Paddy	Provision of drainage	Provision of drainage	Provision of drainage	Provision of drainage
Kharif oil seeds & pulses	Provision of drainage	Provision of drainage	Provision of drainage	Provision of drainage
Horticulture	-	-	-	-
Continuous submergence for more than 2 days				
Paddy	Provision of drainage/ growing of tolerant varieties like; Pankaj	Provision of drainage	Provision of drainage	Provision of drainage
Sea water intrusion	Not applicable			

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				
Paddy	Situation doesn't arise in <i>Kharif</i> rice		Irrigation/ impounding a thin layer of water only in <i>boro</i> rice	--
Wheat	Situation doesn't arise in this stage		Irrigation	-
Summer pulses & oilseeds	Situation doesn't arise in this stage		Light irrigation	-
Horticulture	-	-	-	-
Cold wave	Doesn't prevail in the region			

Frost	Doesn't prevail in the region			
Horticulture				
Tomato	Irrigate the nursery frequently and protect the seedling by temporary shed	Irrigate the crop and use of mulches	Irrigate the crop and use of mulches	Picking the produce & keep in shed
Brinjal				
Cali flower				
Knoolkhol				
Cabbage				
Fruit Crops				
Crop 1 : Mango	Irrigate the nursery frequently and protect the seedling by temp shed and use mulches	Irrigate the crop and use of mulches	Irrigate the crop and use of mulches	Picking the fruits & keep in shed
Crop 2 : Guava				
Crop 3 : Citrus				
Crop 4 : Papaya				
Crop 5 : Banana				
Hailstorm				
Wheat	Re-sowing under irrigated conditions		Plough the field for green manuring & sowing of summer crop under irrigated conditions	Picking of ear heads
Cyclone				
Paddy	Provision of drainage		Provision of drainage	Provision of drainage
Wheat	Provision of drainage		Provision of drainage	Provision of drainage