

State: Maharashtra
Agriculture Contingency Plan: Aurangabad District

1.0 District Agriculture profile				
1.1	Agro-Climatic/ Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Deccan Plateau, Hot Semi-Arid Eco-Region 6.2		
	Agro-Climatic Region (Planning Commission)	Western Plateau and Hills Region (IX)		
	Agro Climatic Zone (NARP)	Western Maharastra Scarcity Zone (MH-6) Central Maharastra Plateau Zone(MH-7)		
	List all the districts or part there of falling under the NARP Zone	Aurangabad, Jalna, Parbhani, Hingoli, Beed, Latur, Osmanabad, Nanded, Dhule, Buldhana, Amravathi, Jalgaon, Akola, Yeotmal		
	Geographic coordinates of district	Latitude	Longitude	Altitude
		19° 52'34.19" N	75°20'35. 93" E	513 m above MSL
	Name and address of the concerned ZRS / ZARS / RARA / RRA / RRTTS	National Agricultural Research Project, Marathwada Agriculture University Parbhani Paithan Road ,Aurangabad 431 005 (Maharashtra)		
	Mention the KVK located in the district	Krishi Vigyan Kendra, (MAU) Paithan Road, Aurangabad, Tehsil & District Aurangabad - 431 005 Mahatma Gandhi Mission's Krishi Vigyan Kendra, Village, Gandheli Tehsil & District Aurangabad 431 003.		
Mention nearest AMFU	AMFU, Parbhani - 431 402			

1.2	Rainfall	Average (mm)	Number of rainy days	Normal Onset (Specify week and month)	Normal Cessation (Specify week and month)
	SW monsoon (June - Sep) :	623.5	33	June 2 nd week (MW 23)	October 1 st week (MW 40)
	NE monsoon (Oct - Dec) :	83.5	6	-	-
	Winter (Jan - Feb) :	3.8	-	-	-
	Summer (Mar - May) :	23.3	-	-	-
	Annual	734.3	39	-	-

(Source: Meteorology Department MAU, Parbhani)

1.3	Land use pattern of the district (latest statistics)	Geographical area ('000 ha)	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable waste land	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	('000 ha)	1007.7	812	72.6	60.5	37.2	15.5	5.7	20.7	46.6	59.0

(Source: Agriculture Statistical Information Maharashtra State 2005- 2006 (Part – II)
(Maharashtra socio-economic database, 2010)

1.4	Major Soils types	Area ('000 ha)	Percent (%) of total geographical area
	1.Deep black soils	200.61	19.91
	2.Medium deep black soils	209.37	20.78
	3.Shallow black soils	597.39	59.30

(Source: NBSS and LUP, Nagpur)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	654.0	120
	Area sown more than once	130.4	
	Gross cropped area	784.4	

1.6	Irrigation	Area ('000 ha)	Percent (%)	
	Net Irrigated area	163.3	20.80	
	Gross irrigated area	200.2		
	Rainfed area	490.7		
	Sources of Irrigation	Number	Area ('000 ha)	(%)
	Canals (1 major project and 19 medium projects)	20	31.08	15.5
	Tanks	148	29.9	14.9
	Open wells	85865	119.38	59.6
	Bore wells	1336	10.93	5.5
	Lift irrigation	2303	6.34	3.2
	Other sources (Farm ponds)	16400	2.54	1.3
	Total		200.17	100.00
	No. of tractors	4435		
	Pump sets	172979		
	Micro-irrigation (2009-10) Drip 6.02 and Sprinkler 1.09 ha	-	7.12	
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited	-	-	-
	Critical	-	-	-
	Semi-critical	-	-	-
	Safe	-	-	-
	Waste water availability and use	-	-	-
	Ground water quality	-	-	safe

* Over-exploited: groundwater utilization > 100%; critical: 90-100% semi-critical: 70-90%; safe: < 70%

*(Source: Strategic Research and Extension Plan of Aurangabad District)

1.7 Area under major field crops & horticulture etc.

1.7	Major Field Crops cultivated	Area ('000 ha)						Summer	Grand Total
		Kharif 2004-05 to 2009-10*			Rabi 2004-05 to 2009-10**				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Cotton	-	243.2	243.2	-	-	-	-	243.2
	Maize	-	97.3	97.3	1.9	-	1.9	7.7	106.9
	Pearl millet	-	124.6	124.6	-	-	-	-	124.6
	Pigeon pea	-	39.9	39.9	-	-	-	-	39.9
	Sorghum	-	10.6	10.6	-	155.9	155.9	-	166.5
	Sugarcane	-	-	-	-	-	-	-	17.7
	Wheat	-	-	-	43.7	-	43.7	-	43.7
	Gram	-	-	-	-	43.2	43.2	-	43.2
	Safflower	-	-	-	-	14.8	14.8	-	14.8
	Groundnut	-	-	-	-	-	-	3.3	3.3
	Sunflower	-	-	-	-	-	-	1.7	1.7
	Horticulture crops – Fruits	Total area (000 ha)							
	Sweet orange (Mosambi)	21.41							
	Mango	20.10							
	Sapota	9.42							
	Custard apple	2.39							
	Promogranate	1.4							
	Horticulture crops - Vegetables	Total area (000 ha)							
	Onion	7.51							
	Chilli	1.1							
	Tomato	1.0							
	Brinjal	0.89							
	Okra (Bhendi)	0.32							
	Total	11.04							
	Medicinal and Aromatic crops	Total area (000 ha)							
	Ginger	5.99							
	Turmeric	0.35							
	Total	6.35							
	Floriculture	-							
	Plantation Crops	Total area		Irrigated		Rainfed			
		Not applicable		-		-			
	Fodder crops	Total area		Irrigated		Rainfed			
	Sericulture etc	0.113		0.113		-			

(Source:* JDA Divisional Kharif review meeting report, 2010 -11;** DSAO ZREAC report Rabi 2010-11)

1.8	Livestock (2003 Census)	Number ('000)	Male	Female	Total
	Non descriptive cattle (local low yielding)		255082	150055	405137
	Crossbred Cattle		30067	81237	111304
	Non descriptive buffaloes (local low yielding)		9915	61061	70976
	Graded buffaloes		-	-	-
	Commercial dairy farms		Not available		
	Goat		84697	290804	375501
	Sheep		25546	56325	81871
	Sheep Crossbred		743	916	1659
Total		406050	640398	1046448	
1.9	Poultry (2003 Census)				
	Commercial		484362		
	Backyard		0		
	Total		484362		
1.10	Fisheries (2008-09)	Area (ha)	Yield (t/ha)		Production (000 tons)
	Brackish water	NA	NA		NA
	Fresh water	12501.35	0.382		4781
	Others	NA	NA		NA

(Source: Maharashtra Animal and Fishery Sciences University, Nagpur-2010)

1.11	Production and Productivity of major crops (Average of last 5 years: 2003 to 2008)	Kharif		Rabi		Summer		Total	
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)
	Cotton	403.4	282	-	-	-	-	403.4	282
	Pearl millet	122.1	980	-	-	-	-	122.1	980
	Maize	247.9	2548	-	-	-	-	247.9	2548
	Pigeon pea	24.5	614	-	-	-	-	24.5	614
	Sorghum	16.0	1509	168.5	1086	-	-	184.5	1297.5
	Sugarcane	-	61.0	1221.3	69.0	-	-	1221.3	69.0
	Wheat	-	-	79.0	1810	-	-	79.0	1810
	Gram	-	-	23.5	544	-	-	23.5	544
	Safflower	-	-	7.9	540	-	-	7.9	540
	Maize (rabi)	-	-	2.1	1145	-	-	2.1	1145
	Groundnut	-	-	-	-	29.0	1272	29.0	1272
	Sunflower	-	-	-	-	9.8	398	9.8	398

	Maize	-	-	-	-	3.3	1031	3.3	1031
	Mosambi	-	-	-	-	-	-	160.81	3500
	Mango	-	-	-	-	-	-	42.53	6000
	Sapota	-	-	-	-	-	-	68.85	2000
	Custard apple	-	-	-	-	-	-	33.01	-
	Promogranate	-	-	-	-	-	-	5.26	5000

(Source: JDA Regional Review Meeting Report, 2010-2011& DSAO Rabi ZREAC meeting report 2010-11)

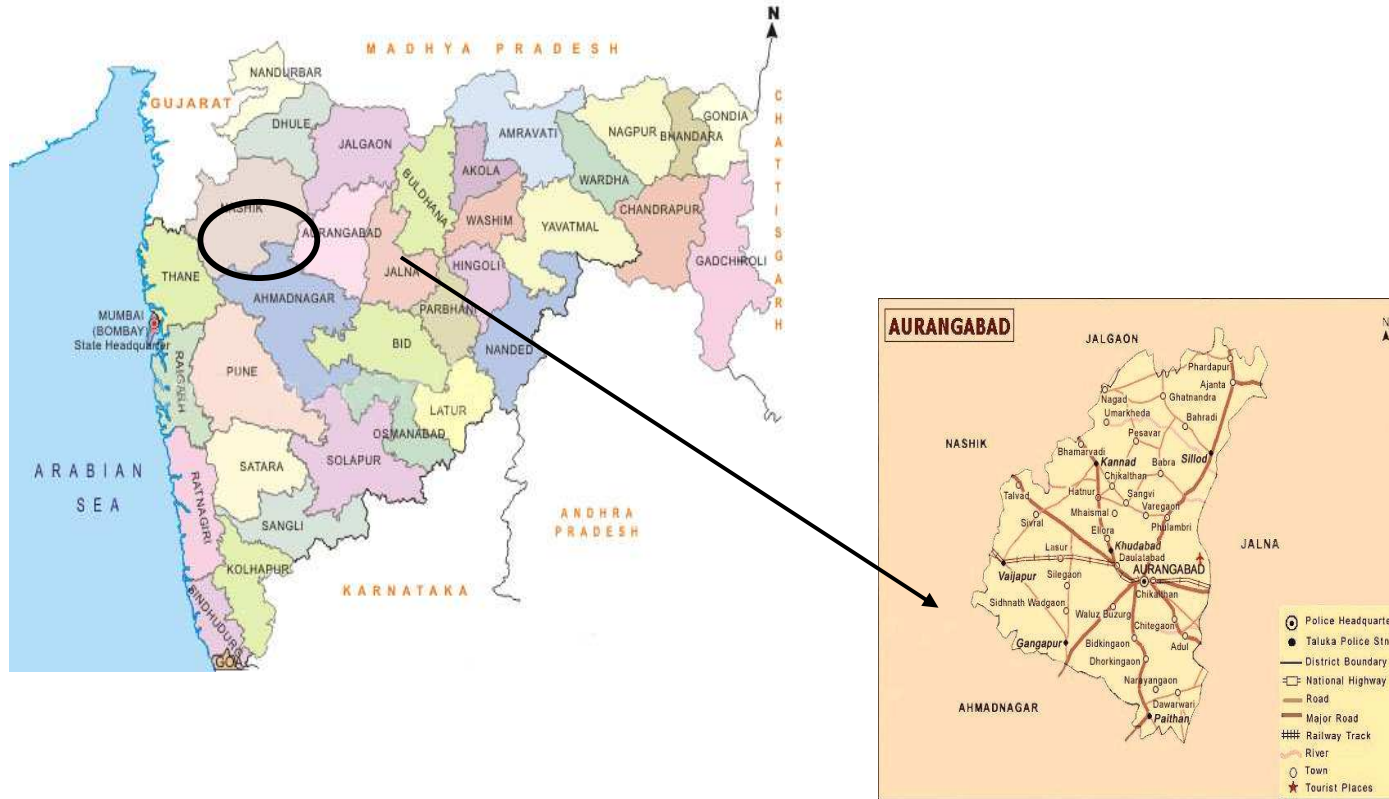
1.12	Sowing window for 5 major crops (start and end of sowing period)	Cotton	Pearl millet	Maize	Pigeon pea	Sorghum
	Kharif - Rainfed	June 15 to July 15	June 15 to July 30	June 15 to July 30	June 15 to July 30	June 15 to July 15
	Kharif - Irrigated	May 15 to June 15	June 15 to July 30	June 15 to July 30		
		Wheat	Gram	Maize	Safflower	Sorghum
	Rabi - Rainfed	-	1 - 15 Oct	-	Sep 15 to Oct 15	1 to 15 Oct
	Rabi - Irrigated	Nov1 to Nov 20	15 Oct – 15 Nov	Oct 15 to Nov 15	Oct 15 to Nov 15	Oct 15 to Nov 15

1.13	What is the major contingency the district is prone to? (Tick mark and mention years if known during the last 10 years period)	Regular	Occasional	None
	Drought	-	√	-
	Flood	-	√	-
	Cyclone	-	-	√
	Hail storm	-	-	√
	Heat wave	-	-	√
	Cold wave	-	-	√
	Frost	-	-	√
	Sea water inundation	-	-	√
	Pests and diseases (specify)	√ 1.Heliothis (pigeonpea , gram) 2.Spodoptera (Soybean) 3.Sphingid (Moong and Urd) 4.Jassids&whitefly (cotton)	-	-

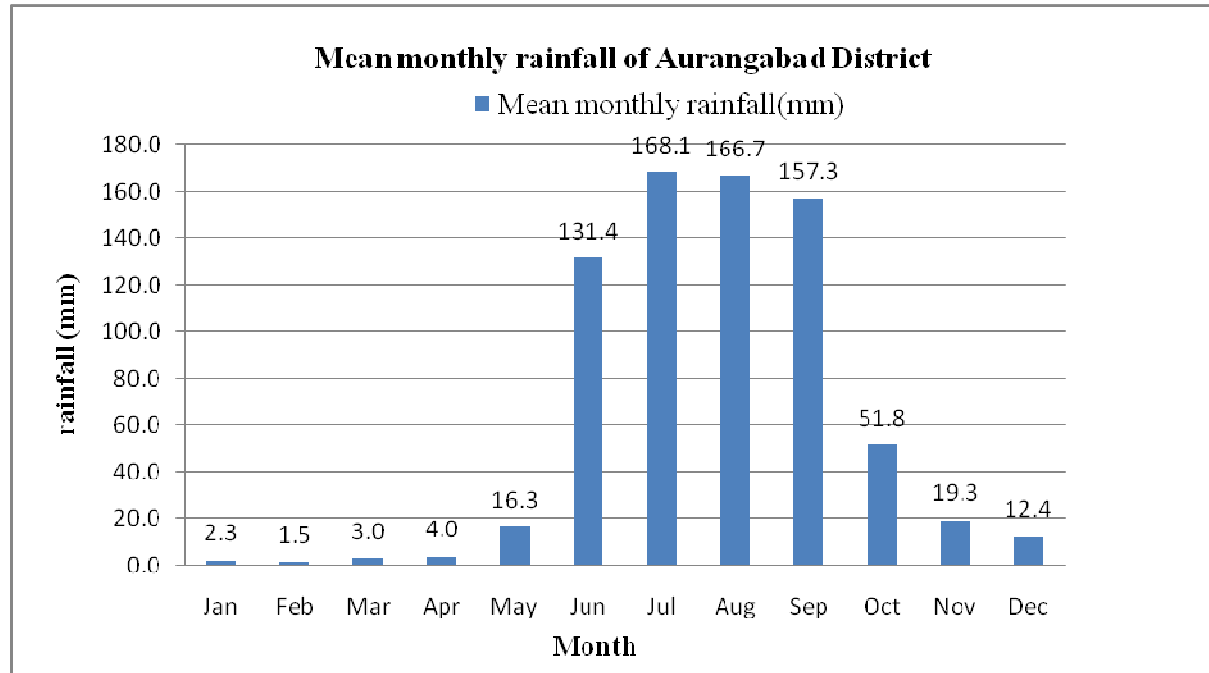
(Source: Maharashtra Animal and Fishery Sciences University, Nagpur)

1.14	Include Digital maps of the district for	Location map of district within States as Annexure 1	Enclosed : Yes
		Mean annual rainfall as Annexure 2	Enclosed : Yes
		Soil map as Annexure 3	Enclosed : Yes

Annexure 1
Location map of Aurangabad district

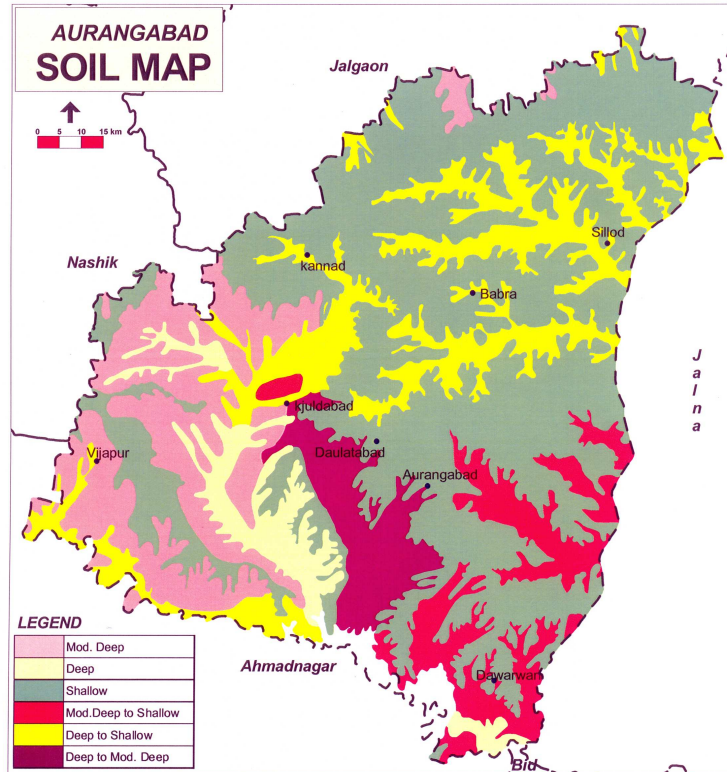


Annexure 2
Mean monthly rainfall of Aurangabad District



(Source: IMD) (1941-1990)

Annexure 3
Soil map of Aurangabad district



(Source: NBSS & LUP Regional Centre, Nagpur)

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Change in crop / cropping system including variety	Suggested Contingency measures	
				Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 4th week of June	Medium deep to deep black soils with assured rainfall	Cotton	No Change	Normal package of practices recommended by MAU, Parbhani	<ul style="list-style-type: none"> • Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeonpea	-do-	-do-	
		Soybean	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	-do-	-do-	
	Shallow black soils with assured rainfall	Cotton	-do-	-do-	
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeonpea	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram / Black gram – Gram / Rabi Sorghum / Safflower	-do-	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)*	Cotton	-do-	-do-	
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeonpea	-do-	-do-	
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	-do-	-do-	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	-do-	-do-	
		Pearl millet / Pearl millet + Pigeonpea	-do-	-do-	
Maize		-do-	-do-		
Pigeonpea		-do-	-do-		

Condition					
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 2nd week of July	Medium deep to deep black soils with assured rainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	<ul style="list-style-type: none"> • Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeonpea	No change, prefer varieties BSMR 736, 853 BDN 708, 711	-do-	
		Soybean	No change or intercropping with pigeonpea in 4:2 or 6:3 row proportion	-do-	
		Sorghum	Cotton / Maize/ Pigeonpea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeonpea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with assured rainfall	Cotton	No change or short duration varieties / hybrids or Cotton + pigeonpea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeonpea	No change. Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-	
		Sorghum	Cotton / Maize/ Pigeonpea (BSMR	-do-	

			736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)		
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeonpea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.		
	Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani		
	Maize	No change	-do-		
	Pigeonpea	No change. Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-		
	Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeonpea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-		
Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.		
	Pearl millet / Pearl millet + Pigeonpea	No change	Normal package of practices recommended by MAU, Parbhani		
	Maize	No change	-do-		
	Pigeonpea	No change. Prefer varieties like BSMR 736, 853 BDN 708, 711	-do-		

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 6 weeks 4th week of July	Medium deep to deep black soils with assured rainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	<ul style="list-style-type: none"> • Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	
		Soybean	No change. Prefer intercropping with pigeon pea in 4:2 or 6:3 row proportion	-do-	
		Sorghum	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with assured rainfall	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeon pea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani (or) adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
		Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		Maize	No change	-do-	
		Pigeon pea	No change. Prefer varieties like BDN 708, 711	-do-	
		Sorghum	Cotton / Maize/ Pigeon pea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden,	-do-	

			SS-56, LSFH-35, BSH-1)	
		Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeonpea (BSMR 736, 853, BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP-92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-
Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani (or) adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.	
	Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
	Maize	No change	-do-	
	Pigeonpea	No change. Prefer varieties like BDN 708, 711	-do-	
	Green gram / Black gram -Chickpea / Rabi Sorghum / Safflower	Cotton / Maize/ Pigeonpea (BDN 708, BDN 711) / Pearl millet (Shradha, Saburi, AIMP- 92901) or Sunflower (Morden, SS-56, LSFH-35, BSH-1)	-do-	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	No change. Prefer short duration varieties / hybrids or Cotton + pigeonpea (BSMR 736, 853, BDN 708,711) in 6:1 row proportion	Normal package of practices recommended by MAU, Parbhani or adopt 20-25% more seed rate than recommended and reduce fertilizer dose by 25 per cent.
	Pearl millet / Pearl millet + Pigeonpea	No change	Normal package of practices recommended by MAU, Parbhani	
	Maize	No change	-do-	
	Pigeonpea	No change. Prefer varieties like BDN 708, 711	-do-	

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 8 weeks 2 nd week of August	Medium deep to deep black soils with assured rainfall	Cotton	Pearl millet (Shradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or Pearl millet + Pigeonpea in 3:3 or 4:2 row proportion or keep fallow and plan for rabi season	Follow <i>in situ</i> soil moisture conservation measures like alternate furrow opening with Balaram plough.	<ul style="list-style-type: none"> • Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	Pearl millet + Pigeonpea in 3:3 or 4:2 row proportion	Open conservation furrow after every 6-8 rows with Balaram plough.	
		Maize	No change. Alternatively go for castor (VI-9, Aruna , DCS-9 (Jyothi), GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Pigeonpea	Pearl millet + Pigeonpea in 3:3 or 4:2 row proportion. Prefer early maturing varieties like BDN-708 / 711	-do-	
		Soybean	-do-	-do-	
		Sorghum	-do-	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow or plan for rabi crops	<ul style="list-style-type: none"> • Open conservation furrow after every 6-8 rows with Balaram plough • Prepare land for early sowing of rabi crops like chickpea, safflower sunflower and sorghum 	
	Shallow black soils with assured rainfall	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1 or Pearl millet + pigeonpea in 2:1 row proportion) or keep fallow and plan for rabi season	Prepare land for early sowing of rabi crops like chickpea, safflower sunflower and sorghum	
		Pearl millet	No change. Prefer intercropping with pigeonpea	Open conservation furrow after every 6-8 rows with Balaram plough	
		Maize	No change /fodder maize	-do-	
		Pigeonpea	Castor (VI-9, Aruna, GCH-4, 5, 6 and DCH-117 / 32)	-do-	

		Sorghum	-do-	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Keep fallow and prepare land for rabi crops.	<ul style="list-style-type: none"> Open conservation furrow after every 6-8 rows with Balaram plough Prepare land for early sowing of rabi crops like chickpea, safflower sunflower and sorghum 	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow (plan for rabi) or Pearl millet + pigeonpea in 2:1 row proportion	Follow <i>in situ</i> soil moisture conservation measures like alternate furrow opening with Balaram plough	
		Pearl millet	No change. Prefer intercropping with pigeonpea in 3:3 or 4:2 row proportion	-do-	
		Maize	No change /fodder maize (African Tall)	-do-	
		Pigeonpea	Castor (VI-9, Aruna, GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	-do- Prepare land for rabi crop	<ul style="list-style-type: none"> Open conservation furrow after every 6-8 rows with Balaram plough. Prepare land for early sowing of rabi crops like chickpea, safflower sunflower and sorghum 	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Pearl millet (Sradha, Saburi, AIMP-92901), Sunflower (Morden, SS-56, LSFH-35, BSH-1) or fallow (plan for rabi) or Pearl millet + pigeonpea in 2:1 row proportion	Follow <i>in situ</i> soil moisture conservation measures like alternate furrow opening with Balaram plough	
		Pearl millet / Pearl millet + Pigeonpea	No change. Prefer intercropping with pigeonpea	-do-	
		Maize	No change /fodder maize	-do-	
Pigeonpea		Castor (VI-9, Aruna, DCS-9 (Jyothi), GCH-4, 5, 6 and DCH-117 / 32)	-do-		

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 deep to deep black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> Gap filling within the rows with same cultivar or pigeonpea to maintain at least 75% plant population. Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. Give protective irrigation wherever possible 	<ul style="list-style-type: none"> Avoid applying fertilizers till sufficient soil moisture is available Interculture with harrows 	<ul style="list-style-type: none"> Linkage with MAU, MSSC and NSC for seed. Linkage with MAIDC for implements. Linkage with MAU, KVK for agro techniques.
		Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Pigeonpea	-do-	-do-	
		Soybean	-do- or if the plant population is less than 50% go for re sowing of the crop	-do-	
		Sorghum	Gap filling with pearl millet / pigeonpea	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> If the plant population is less than 75% of optimum, go for re sowing of the alternate crops like pearl millet / sunflower / pigeonpea If possible give protective irrigation with sprinkler 	-do-	
	Shallow black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> Gap filling within the rows with same cultivar or pigeonpea to maintain at least 75% plant population. Raise cotton seedlings in 	<ul style="list-style-type: none"> Avoid applying fertilizers till sufficient soil moisture is available Interculture with harrows 	

			polythene bags and transplant when sufficient soil moisture is available. <ul style="list-style-type: none"> Give protective irrigation wherever possible 		
		Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Pigeon pea	-do-	-do-	
		Sorghum	Gap filling with pigeonpea	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> If the plant population is less than 75% of optimum, go for re sowing of the alternate crops like pearl millet / sunflower / pigeonpea If possible give protective irrigation with sprinkler. 	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	<ul style="list-style-type: none"> Gap filling within the rows with same cultivar or pigeonpea to maintain at least 75% plant population. Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. Give protective irrigation wherever possible 	<ul style="list-style-type: none"> Avoid applying fertilizers till sufficient soil. moisture is available Making of conservation furrows for moisture conservation Interculture with harrows 	
		Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with hoe.	
		Maize	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	

		Pigeonpea	-do-	-do-
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> If the plant population is less than 75% of optimum, go for re sowing of the alternate crops like pearl millet / sunflower / pigeon pea . If possible give protective irrigation with sprinkler 	-do-
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	<ul style="list-style-type: none"> Gap filling within the rows with same cultivar or pigeonpea to maintain at least 75% plant population. Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. Give protective irrigation wherever possible 	<ul style="list-style-type: none"> Avoid applying fertilizers till sufficient soil. moisture is available Making of conservation furrows for moisture conservation Interculture with harrows
		Pearl millet / Pearl millet + Pigeonpea	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with hoe.
		Maize	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-
	Pigeonpea	-do-	-do-	

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 deep to deep black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> Avoid top dressing of fertilizers till sufficient soil moisture is available. Interculture with harrow for weeding and 	<ul style="list-style-type: none"> Mulching with crop residue @ 3-5 t / ha Foliar spray of 2% KNO₃, urea, DAP, MgSO₄, Zinc, Boron Mulching with crop residue @ 3-5 t / ha 	<ul style="list-style-type: none"> Linkage with MAU, MSSC and NSC for seed. Linkage with MAIDC for

			to create soil mulch.		implements. • Linkage with MAU, KVK for agro techniques.
		Pearl millet	-do-	Opening of alternate furrows with Balaram plough.	
		Maize	-do-	<ul style="list-style-type: none"> • Opening of alternate furrows with Balaram plough • Mulching with crop residue @ 3-5 t / ha 	
		Pigeonpea	-do-	Spraying of 2% urea or DAP	
		Soybean	Interculture for weeding and to create soil mulch.	-do-	
		Sorghum	<ul style="list-style-type: none"> • Avoid top dressing of fertilizers till sufficient soil moisture is available. • Give protective irrigation wherever possible • Intra row thinning 	<ul style="list-style-type: none"> • Opening of alternate furrows with Balaram plough. • Mulching with crop residue @ 3-5 t / ha 	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> • Interculture for weeding and to create soil mulch. • If possible give protective irrigation with sprinkler 	<ul style="list-style-type: none"> • Spraying of 2% urea or DAP • Interculture with hoe 	
	Shallow black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> • Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation wherever possible 	<ul style="list-style-type: none"> • Opening of alternate furrows with Balaram plough. • Mulching with crop residues @ 3-5 t / ha within the rows 	
		Pearl millet	-do-	-do-	
		Maize	-do-	-do-	
		Pigeonpea	Interculture for weeding and to create soil mulch	<ul style="list-style-type: none"> • Spraying of 2% urea or DAP • Opening of alternate furrows with Balaram plough. 	

		Sorghum	<ul style="list-style-type: none"> • Avoid top dressing of fertilizers till sufficient soil moisture is available. • Give protective irrigation wherever possible 	<ul style="list-style-type: none"> • Interculture for weeding and to create soil mulch to conserve moisture. • Opening of alternate furrows
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> • Interculture for weeding and to create soil mulch. • If possible give protective irrigation with sprinkler 	Spraying of 2% urea or DAP
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	<ul style="list-style-type: none"> • Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation wherever possible 	<ul style="list-style-type: none"> • Opening of alternate furrows with Balaram plough. • Mulching with crop residue • Spraying of 2% urea or DAP
		Pearl millet	-do-	-do-
		Maize	-do-	-do-
		Pigeonpea	-do-	<ul style="list-style-type: none"> • Spraying of 2% urea or DAP • Opening of alternate furrows with Balaram plough.
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> • Interculture for weeding and to create soil mulch. • If possible give protective irrigation with sprinkler 	Spraying of 2% urea or DAP
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	<ul style="list-style-type: none"> • Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. 	<ul style="list-style-type: none"> • Opening of alternate furrows with Balaram plough. • Mulching with crop residue @ 3-5 t / ha • Spraying of 2% urea or DAP

			<ul style="list-style-type: none"> Give protective irrigation wherever possible 	
		Pearl millet / Pearl millet + Pigeonpea	-do-	-do-
		Maize	-do-	-do-
		Pigeonpea	-do-	<ul style="list-style-type: none"> Spraying of 2% urea or DAP Opening of alternate furrows with Balaram plough.

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	Medium deep to deep black soils with assured rainfall	Cotton	Give protective irrigation with drip	<ul style="list-style-type: none"> Foliar spray of 2% KNO₃, urea, DAP, MgSO₄, Zinc, Boron. Mulching with crop residue @ 3-5 t / ha. 	<ul style="list-style-type: none"> Linkage with MAIDC / DSAO for intercultural implements (Harrow, hoe). Linkage with RKVY for farm ponds and micro irrigation system.
		Pearl millet	-do-	Mulching with crop residue @ 3-5 t / ha	
		Maize	-do-	<ul style="list-style-type: none"> Mulching with crop residue @ 3-5 t / ha If feasible spray anti-transparent 6% kaolin 	
		Pigeonpea	Give protective irrigation with sprinkler	Foliar spray of 2% KNO ₃ , urea and DAP	
		Soybean	-do-	-do-	
		Sorghum	-do-	<ul style="list-style-type: none"> Mulching with crop residue @ 3-5 t / ha If feasible spray anti-transparent 6% kaolin 	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Give protective irrigation with sprinkler	Spraying of 2% urea and DAP	
	Shallow black soils with assured rainfall	Cotton	Give protective irrigation	<ul style="list-style-type: none"> Foliar spray of 2% KNO₃, urea and DAP. Mulching with crop residue @ 3-5 t / ha. 	
		Pearl millet	-do-	Mulching with crop residue @ 3-5 t / ha	
		Maize	<ul style="list-style-type: none"> Give protection irrigation In case of severe stress harvest as green fodder 	<ul style="list-style-type: none"> If feasible spray anti-transparent 6% kaolin. 	
Pigeonpea		Give protective irrigation	Foliar spray of 2% KNO ₃ , urea and DAP		

		Sorghum	<ul style="list-style-type: none"> Give protection irrigation In case of severe stress harvest as green fodder 	If feasible spray anti-transparent 6% kaolin
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> Give protection irrigation with sprinkler In case of severe stress harvest as green fodder / green manuring 	Spraying of 2% urea and DAP
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Give protective irrigation with drip	<ul style="list-style-type: none"> Foliar spray of 2% KNO₃, urea and DAP, MgSO₄, Zinc, Boron. Mulching with crop residue @ 3-5 t / ha.
		Pearl millet	Give protective irrigation	Mulching with crop residue @ 3-5 t / ha
		Maize	-do-	-do-
		Pigeonpea	-do-	Foliar spray of 2% KNO ₃ , urea and DAP
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	-do-	Spraying of 2% urea and DAP
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	Give protective irrigation with drip	<ul style="list-style-type: none"> Foliar spray of 2% KNO₃, urea and DAP Mulching with crop residue @ 3-5 t / ha
		Pearl millet / Pearl millet + Pigeonpea	Give protection irrigation	-
		Maize	<ul style="list-style-type: none"> Give protection irrigation In case of severe stress harvest as green fodder 	<ul style="list-style-type: none"> Mulching with crop residue @ 3-5 t / ha within the rows If feasible spray anti-transparent 6% kaolin.
		Pigeonpea	Give protection irrigation	Foliar spray of 2% KNO ₃ , urea and DAP

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Medium deep to deep black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> Life saving irrigation with drip Picking 	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	<ul style="list-style-type: none"> Linkage with MAIDC / DSAO for intercropping implements
		Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	
		Maize	-do-	-do-	
		Pigeonpea	Life saving irrigation	-	

		Soybean	-do-	Plan for rabi crops chickpea / safflower	(Harrow, hoe). • Linkage with RKVY for farm ponds and micro irrigation system.
		Sorghum	Life saving irrigation or harvest at physiological maturity	-do-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Harvest at physiological maturity	Plan for rabi crops chickpea / safflower / rabi sorghum / sunflower	
	Shallow black soils with assured rainfall	Cotton	<ul style="list-style-type: none"> Life saving irrigation Picking 	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	
		Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	
		Maize	<ul style="list-style-type: none"> Life saving irrigation In case of severe stress harvest as green fodder 	-do-	
		Pigeonpea	Life saving irrigation	Foliar spray of 2% KNO ₃ , urea and DAP	
		Sorghum	<ul style="list-style-type: none"> Life saving irrigation In case of severe stress harvest as green fodder 	Plan for rabi crops chickpea / safflower	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Harvest at physiological maturity	Plan for rabi crops chickpea / safflower / rabi sorghum / sunflower	
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Cotton	<ul style="list-style-type: none"> Life saving irrigation with drip Picking 	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	
		Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	
		Maize	-do-	-do-	
		Pigeonpea	Life saving irrigation	-	
		Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	Harvest at physiological maturity	Plan for rabi crops chickpea / safflower / rabi sorghum / sunflower	
	Shallow black soils with low rainfall (Vaijapur and	Cotton	<ul style="list-style-type: none"> Life saving irrigation with drip Picking 	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	
		Pearl millet / Pearl	Life saving irrigation or harvest at	Plan for rabi crops chickpea / safflower after	

	Gangapur tehsils)	millet + Pigeonpea	physiological maturity	harvest of sole pearl millet	
		Maize	<ul style="list-style-type: none"> Life saving irrigation In case of severe stress harvest as green fodder 	Plan for rabi crops chickpea / safflower	
		Pigeonpea	Life saving irrigation	Foliar spray of 2% KNO ₃ , urea and DAP	

2.1.2 Irrigated situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		Remarks on Implementation
			Change in crop / cropping system	Agronomic measures	
Delayed release of water in canals due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or prefer irrigated cotton	<ul style="list-style-type: none"> Raising of nurseries with single budded setts to save the time and water for pre-seasonal planting Drip system for enhancing the water productivity Mulching with sugarcane trash between rows and frequent interculture to conserve moisture 	<ul style="list-style-type: none"> Linkage with VSI and Sugarcane Research Station, Padegeon for supply of foundation planting material of improved varieties Co-86012, Co-0265, Co-94012 Linkage with MAU, Parbhani, MSSC, NSC and NFSM for supply of seed Linkage with DSAO for micro irrigation system through RKVY and
		Wheat	No change. Depending upon time of release of water go for timely (HD-2496, HD-2189, Triambak) / late sown (HD-2189, Kailash) wheat varieties	Give irrigation at critical stages of crop growth	
		Chickpea	Use early maturing varieties ICCV-2	Use drip irrigation / give irrigation at critical crop growth stages (branching and pod formation)	
		Safflower	Use improved varieties PBNS-12 / 40	Use drip irrigation / give irrigation at critical crop growth stages (branching and capsule formation)	
		Ginger	No change	Use drip irrigation	
		Turmeric	No change	-do-	
		Chilli	No change	-do-	
		Rabi onion	No change	-do-	
	Shallow black soils with assured rainfall	Ginger / turmeric	Rabi onion / summer pearl millet	-do-	
	Medium deep to deep black soils with low rainfall (Vaijapur and	Sugarcane	Irrigated cotton / wheat	Give irrigation at critical stages of crop growth	
Wheat		No change. Depending upon time of release of water go for timely sown	Give irrigation at critical stages of crop growth		

	Gangapur tehsils)		(HD-2496, HD-2189, Triambak) / late sown (HD-2189, Kailash) wheat varieties		NHM.
		Chickpea	Use early maturing varieties i. e. ICCV-2	Use drip irrigation / give irrigation at critical crop growth stages (branching and pod formation)	
		Safflower	Use improved varieties i.e. PBNS-12 / 40	Use drip irrigation / give irrigation at critical crop growth stages (branching and capsule formation)	
		Ginger	No change	Use drip irrigation	
		Turmeric	No change	-do-	
		Chilli	No change	-do-	
		Rabi onion	No change	-do-	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Wheat	Chickpea / safflower / summer pearl millet / fodder maize	Use drip irrigation and give irrigation at critical growth stages	

Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or prefer irrigated cotton / wheat / safflower / chickpea / rabi onion	<ul style="list-style-type: none"> Water saving measures such as alternate furrow Give irrigation at critical crop growth stages 	Linkage with Irrigation Department for release of water at critical growth stages
		Wheat	Use low water requiring varieties Lok-1, PBN-1, Kailash		
		Chickpea	No change		
		Safflower	No change		
		Ginger	Wheat		
		Turmeric	Wheat		
		Chilli	Rabi onion		
	Rabi onion	No change			
	Shallow black soils with assured rainfall	Wheat	Chickpea / fodder maize / safflower		
		Safflower	No change		
		Ginger	Chickpea / safflower		
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Irrigated cotton / wheat / rabi onion		

	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sunflower	No change or prefer fodder maize		
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Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Medium deep to deep black soils with assured rainfall	Sugarcane	Cotton / soybean / pigeonpea / maize	<ul style="list-style-type: none"> • Interculture operations and mulching to conserve soil moisture. • Basal application of all the recommended fertilizers. 	Liasion with Irrigation Department for release of water at critical growth stages
		Ginger	Chickpea / safflower / sunflower / rabi sorghum	-do-	
		Turmeric	-do-		
		Chilli	-do-		
	Shallow black soils with assured rainfall	Chickpea / safflower	No change		
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Cotton / soybean / pigeonpea / maize		
		Ginger	Chickpea / safflower / sunflower / maize		
		Turmeric	-do-		
		Chilli	-do-		
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Chickpea / safflower / maize fodder	No change		

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient / delayed onset of monsoon	Medium deep to deep black soils with assured rainfall	Not applicable			
	Shallow black soils with assured rainfall	Not applicable			
	Medium deep to deep black soils with low rainfall (Vaijapur and	Not applicable			

	Gangapur tehsils)	
	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Not applicable

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		Remarks on Implementation
			Change in crop / cropping system	Agronomic measures	
Insufficient groundwater recharge due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change. Prefer alternate crops like cotton, soybean, maize / wheat / cowpea / sunflower	Limited irrigation / Drip / Alternate furrow irrigation or harvest for fodder purpose	Supply of seed through MSSC, NFSM, MAU, Village seed production programme
		Wheat	Rabi sorghum	-do-	
		Chickpea	No change or prefer varieties like BDN-9-3, Akash, Vijay, Vikas	-do-	
		Safflower	No change or prefer varieties like PBNS-12/40, Sharada, Naari-6	-do-	
		Ginger	Sorghum (M-35-1, Parbhani Moti) / chickpea (BDN-9-3, Akash, Vijay) / safflower (PBNS-12/40, Sharada, Naari-6)	-do-	
		Turmeric	-do-	-do-	
		Chilli	-do-	-do-	
		Rabi onion	-do-	-do-	
	Shallow black soils with assured rainfall	Not applicable			
	Medium deep to deep black soils with low rainfall (Vaijapur and Gangapur tehsils)	Sugarcane	Prefer alternate crops like cotton, soybean, maize and pigeonpea	-do-	
		Wheat	Rabi sorghum	-do-	
		Chickpea	No change or prefer varieties like BDN-9-3, Akash, Vijay, Vikas	-do-	
		Safflower	No change or prefer varieties like PBNS-12/40, Sharada, Naari-6	-do-	
		Ginger	Sorghum (M-35-1, Parbhani Moti) / chickpea (BDN-9-3, Akash, Vijay) / safflower (PBNS-12/40, Sharada, Naari-6)	-do-	
		Turmeric	-do-	-do-	
Chilli		-do-	-do-		
Rabi onion	-do-	-do-			

	Shallow black soils with low rainfall (Vaijapur and Gangapur tehsils)	Not applicable	

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

Condition- Continuous high rainfall in a short span leading to water logging				
Crop	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity Stage	Post harvest
Cotton	<ul style="list-style-type: none"> Open field channels to drain excess water and avoid surface ponding. Apply 2% urea foliar spray after cessation of rains. Interculture at optimum soil moisture to improve soil aeration. 	<ul style="list-style-type: none"> Open field channels to drain excess water and avoid surface ponding. Apply multi-nutrient or hormonal spray to promote flowering 	<ul style="list-style-type: none"> Open field channels to drain excess water and avoid surface ponding. Timely picking of cotton 	<ul style="list-style-type: none"> Protect picked cotton in storage from drenching and soiling Drying of wet cotton and marketing
Pearl millet	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 20 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 20 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Harvest at physiological maturity 	Dry the grain to optimum moisture content before storage
Maize	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Harvest green cobs from dislodged plants for immediate marketing 	<ul style="list-style-type: none"> Harvest the cobs after they are dried up properly Dry the grain to optimum moisture content before storage
Pigeonpea	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	<ul style="list-style-type: none"> Drain excess water as early as possible Allow the crop to dry completely before harvesting 	<ul style="list-style-type: none"> Spread the bundles drenched in the rain on field bunds / drying floors to quicken drying Thresh bundles after they are dried properly Dry the grain to proper moisture content before bagging and storing

Soybean	Provide drainage to drain excess water	Provide drainage to drain excess water	Timely harvest of produce at maturity stage	Shifting to safer place and drying the produce
Sorghum	<ul style="list-style-type: none"> • Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> • Drain excess water as early as possible • Intercultivation with hoe • Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> • Drain excess water as early as possible • Harvest the earheads after they are dried up properly or use ear head drier 	Dry the grain to optimum moisture content before storage
Green gram / Black gram –Chickpea	Drain excess water as early as possible	Drain excess water as early as possible	<ul style="list-style-type: none"> • Drain excess water as early as possible • Allow the crop to dry completely before harvesting 	Quick drying followed by threshing
Horticulture – Fruits				
Sweet orange (Mosambi)	<ul style="list-style-type: none"> • Drain excess water from the field • Keep the field clean and do earthing up 	<ul style="list-style-type: none"> • Drain excess water from the field • Keep the field clean and do earthing up • Spray micro nutrients 	<ul style="list-style-type: none"> • Spray fungicides like Bavistin @ 1 gm/1lt water after rain stop as a preventive measure to control disease • Harvest mature produce on clear sunny day • Fallen fruit may be collected, graded and marketed if feasible 	<ul style="list-style-type: none"> • Store fruits in well ventilated temporary structures before marketing • Market the fruits as soon as possible
Mango	-do-	-do-	-do-	-do-
Sapota	-do-	-do-	-do-	-do-
Custard apple	-do-	-do-	-do-	-do-
Pomegranate	-do-	-do-	-do-	-do-
Condition-Heavy rainfall with high speed winds in a short span				
Cotton	<ul style="list-style-type: none"> • Open field channels to drain excess water and avoid surface ponding. • Apply 2% urea foliar spray after cessation of rains. • Interculture at optimum soil moisture to improve soil aeration and to provide anchorage 	<ul style="list-style-type: none"> • Open field channels to drain excess water and avoid surface ponding. • Apply multi-nutrient or hormonal spray to promote flowering • Provide soil support 	<ul style="list-style-type: none"> • Open field channels to drain excess water and avoid surface Ponding. • Timely picking of cotton • Keep the fallen and soiled bolls and lint separately for drying 	<ul style="list-style-type: none"> • Protect picked cotton in storage from drenching and soiling • Drying of wet cotton and marketing • Keep the fallen and soiled bolls and lint separately for drying and marketing
Pearl millet	<ul style="list-style-type: none"> • Drain excess water as early as possible • Intercultivation with hoe 	Drain excess water as early as possible	Drain excess water as early as possible	Dry the grain to optimum moisture content before storage

	<ul style="list-style-type: none"> Apply 20 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Intercultivation with hoe Apply 20 kg additional N / ha after draining of excess water Tie fallen group of plants with leaves to prevent crop loss 	<ul style="list-style-type: none"> Tie fallen group of plants with leaves to prevent crop loss Harvest at physiological maturity 	
Maize	<ul style="list-style-type: none"> Drain excess water as early as possible Interculture Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 25 kg additional N / ha after draining of excess water Tie fallen group of plants with leaves to prevent crop loss 	<ul style="list-style-type: none"> Drain excess water as early as possible Tie fallen group of plants with leaves to prevent crop loss Harvest green cobs from dislodged plants for immediate marketing 	<ul style="list-style-type: none"> Harvest the cobs after they are dried up properly Dry the grain to optimum moisture content before storage
Pigeonpea	Open field channels to drain excess water and avoid surface ponding and interculture at optimum soil moisture to improve aeration	<ul style="list-style-type: none"> Open field channels to drain excess water and avoid surface Ponding and interculture at optimum soil moisture to improve aeration Tie fallen group of plants to prevent crop loss 	<ul style="list-style-type: none"> Drain excess water as early as possible Allow the crop to dry completely before harvesting Tie fallen group of plants to prevent crop loss 	<ul style="list-style-type: none"> Spread the bundles drenched in the rain on field bunds / drying floors to quicken drying Thresh bundles after they are dried properly Dry the grain to proper moisture content before bagging and storing
Sorghum	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 25 kg additional N / ha after draining of excess water 	<ul style="list-style-type: none"> Drain excess water as early as possible Intercultivation with hoe Apply 25 kg additional N / ha after draining of excess water Tie fallen group of plants to prevent crop loss 	<ul style="list-style-type: none"> Drain excess water as early as possible Tie fallen group of plants to prevent crop loss Harvest the ear heads after they are dried up properly or use ear head drier 	<ul style="list-style-type: none"> Dry the grain to optimum moisture content before storage
Green gram / Black gram - Gram	Drain excess water as early as possible	Drain excess water as early as possible	<ul style="list-style-type: none"> Drain excess water as early as possible Allow the crop to dry completely before harvesting 	Quick drying of pods followed by threshing
Horticulture				
Sweet orange (Mosambi)	<ul style="list-style-type: none"> Drain excess water from the field Keep the field clean and do earthing up 	<ul style="list-style-type: none"> Drain excess water from the field Keep the field clean and do earthing up 	<ul style="list-style-type: none"> Spray fungicides like Bavistin @ 1 gm/lt of water of after rain stop as a 	<ul style="list-style-type: none"> Store fruits in well ventilated temporary structures before

	<ul style="list-style-type: none"> Go for staking if needed 	<ul style="list-style-type: none"> Spray micro nutrients Go for staking if needed 	<p>preventive measure to control disease</p> <ul style="list-style-type: none"> Go for staking if needed Harvest mature produce on clear sunny day Fallen fruit may be collected, graded and marketed if feasible 	<ul style="list-style-type: none"> Marketing the fruits as soon as possible
Mango	-do-	-do-	-do-	-do-
Sapota	-do-	-do-	-do-	-do-
Custard apple	-do-	-do-	-do-	-do-
Pomegranate	-do-	-do-	-do-	-do-
Condition-Outbreak of pests and diseases due to unseasonal rains				
Cotton	Protect against incidence of wilt and root rot. Drenching of Copper oxy chloride (COC) 0.3% or carbendazim 0.1%	<ul style="list-style-type: none"> When marginal yellowing of leaves due to jassid injury is seen, spray neem oil 0.3% with sticker or imidacloprid 0.6 ml / lit or acetamiprid 0.1-0.2 ml /lit Protect against Bacterial leaf blight (BLB) with foliar application of streptocycline sulphate 6 gm + 30 gm COC for every 10 lt of water 	To control grey mildew and boll rot, apply carbendazim 1 gm/ lit or mancozeb 3 gm / lit	Proper storage of seed cotton to prevent wetting and incidence of molds
Maize		Foliar application of Mancozeb 0.25 to 0.4% at 8-10 days interval to control Turcicum leaf blight	<i>Trichoderma</i> mixed with FYM 10 gm / kg at 10 days prior to its use in the field can be applied to control stalk rot which is likely during post flowering	-do-
Pearl millet	-	-	-	-do-
Pigeonpea	Soil application of <i>Trichoderma harzianum</i> along with FYM as side dressing to prevent <i>Fusarium</i> wilt	Drenching of carbendazim 0.1% at plant base to control wilt Foliar application of acephate 1.5 gm / Lt or Miticide to prevent sterility mosaic virus	Drench with carbendazim 0.1% at plant base to control wilt	Quick drying to prevent molds
Sorghum	Shootfly	Midge,	Earhead bug, web worm, grain mold	-do-
Horticulture-Fruits				
Sweet orange (Mosambi)	Protect against citrus <i>psylla</i> with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml /10 lt	Protect against citrus <i>psylla</i> with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25 EC 4 ml /10 lt	-	-

Mango	<ul style="list-style-type: none"> Spray imidacloprid 0.3ml or dimethoate 1 ml / lit to control leaf hopper Drench the seedlings with COC 0.3 % against root rot 	Spray imidacloprid 0.3ml or dimethoate 1 ml / lit to control leaf hopper	Spray Dithane M-45 3 gm / lit or carbendazim 1 gm / lit against anthracnose Spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening of fruits
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2.3 Floods:

Condition- Transient water logging / partial inundation and Continuous submergence for more than 2 days				
Crop	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Cotton	<ul style="list-style-type: none"> Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water Take up the gap filling Intercultivation at optimum field moisture condition Spray water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition In case of severe damage, prefer resowing with short duration hybrids 	<ul style="list-style-type: none"> Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water Intercultivation at optimum field moisture condition Spray water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition Need based correction of micronutrients like Zn by spraying ZnSo₄, Mg through MgSo₄ and Boron two times at 7-10 days interval 	<ul style="list-style-type: none"> Drain stagnated water at the earliest. Spray water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition 	<ul style="list-style-type: none"> Keep the fallen and soiled bolls and lint separately for drying and marketing Proper storage of picked cotton to avoid wetting and maintaining quality of lint
Pearl millet	<ul style="list-style-type: none"> Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water Take up the gap filling by transplanting Intercultivation at optimum field moisture condition In case of severe damage, prefer re sowing with short duration hybrids 	<ul style="list-style-type: none"> Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water Intercultivation at optimum field moisture condition 	<ul style="list-style-type: none"> Drain stagnated water at the earliest Tie the lodged plants as bundles with leaves Harvest ear heads on clear sunny day 	Maintain optimum moisture of the grain by drying in sun or driers
Maize	-do-	-do-	<ul style="list-style-type: none"> Drain stagnated water at the earliest Tie the lodged plants as bundles with leaves Harvest cobs on clear sunny day 	-do-

Pigeonpea	<ul style="list-style-type: none"> • Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Take up the gap filling with short duration varieties • Intercultivation at optimum field moisture condition • In case of severe damage, prefer resowing with short duration hybrids 	<ul style="list-style-type: none"> • Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Intercultivation at optimum field moisture condition 	Foliar spray of 2% Urea, DAP and KNO ₃	<ul style="list-style-type: none"> • Spread the bundles drenched in the rain on field bunds / drying floors to quicken drying • Thresh bundles after they are dried properly • Dry the grain to proper moisture content before bagging and storing
Soybean	-do-	-do-	<ul style="list-style-type: none"> • Drain stagnated water at the earliest • Foliar spray of 2% Urea, DAP and KNO₃ • Harvest and thresh the crop on clear sunny day 	Dry the grain to proper moisture content before bagging and storing
Sorghum	-do-	-do-	<ul style="list-style-type: none"> • Drain stagnated water at the earliest • Tie the lodged plants as bundles with leaves • Harvest ear heads on clear sunny day 	Maintain optimum moisture of the grain by drying in sun or driers
Green gram / Black gram - Chickpea / Rabi Sorghum / Safflower	<ul style="list-style-type: none"> • Drain stagnated water at the earliest and apply 20 kg N / ha after draining excess water • Take up the gap filling • Intercultivation at optimum field moisture condition • In case of severe damage, prefer resowing of the same or other crops considering growing season 	-do-	<ul style="list-style-type: none"> • Drain stagnated water at the earliest • Foliar spray of 2% Urea, DAP and KNO₃ • Harvest and thresh the crop on clear sunny day • Incorporate biomass into the soil if the crop is damaged severely 	Dry the grain to proper moisture content before bagging and storing
Horticulture				
Sweet orange (Mosambi)	<ul style="list-style-type: none"> • Drain stagnated water at the earliest • Earthing up operation to support the crop • Intercultivation at optimum field moisture condition to improve aeration and weed control 	<ul style="list-style-type: none"> • Drain stagnated water at the earliest • Earthing up operation to support the crop • Intercultivation at optimum field moisture condition to improve 	<ul style="list-style-type: none"> • Drainage of stagnation water • Earthing up operation to support the crop • Micronutrient spray, spray fungicides like bavistin, ridomyl 	Collect dropped fruits, grade, and market if feasible

	<ul style="list-style-type: none"> Removal of dirt from soiled seedlings with water spray Staking of plants stakes to prevent lodging 	<ul style="list-style-type: none"> aeration and weed control Staking of plants stakes to prevent lodging Apply organic manure, fertilizers and micronutrients as per the recommendations of MAU, Parbhani depending on age of crop 		
Mango	-do-	-do-	-do-	-do-
Sapota	-do-	-do-	-do-	-do-
Custard apple	-do-	-do-	-do-	-do-
Promogranate	-do-	-do-	-do-	-do-
Sea water inundation	Not applicable			

2.4. Extreme events: Not applicable

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the events	During the event	After the event
Drought			
Feed and fodder availability	<p>Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production</p> <p>Collection of soya meal waste and sunflower/safflower/ groundnut seed cake for use as feed supplement during drought</p> <p>Motivating the sugarcane farmers to convert green sugarcane tops in to silage by the end of February</p> <p>Preserving the green maize fodder as silage</p> <p>Development of hortipastoral systems inexisting orchards</p> <p>Establishment of fodder bank at village level with available dry fodder (wheat straw, Sorghum/ Bajra stover, groundnut haulms, sugarcane tops)</p> <p>Development of silvopastoral models with Leucaena, Glyricidia, Prosopis as fodder trees and Marvel, Madras Anjan, Stylo, Desmanthus, etc., as under</p>	<p>Harvest and use biomass of dried up crops (Pearlmillet, Pigeon pea, Sorghum, maize, Wheat, Green gram, Black gram, Soybean, cluster bean) material as fodder</p> <p>Use of unconventional and locally available cheap feed ingredients especially soya meal waste and sunflower/safflower/ groundnut seed cake for feeding of livestock during drought</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding high productive animals during drought</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p>	<p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with input subsidy</p> <p>Supply of quality seeds of COFS 29, Stylo and fodder slips of Marvel, Yaswant, Jaywant, Napier, guinea grass well before monsoon</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>

	<p>storey grass</p> <p>Encourage fodder production with Sorghum – stylo-Sorghum on rotation basis and also to cultivate short-term fodder crops like sunhemp</p> <p>Promote Azola cultivation at backyard</p> <p>Formation of village Disaster Management Committee</p> <p>Capacity building and preparedness of the stakeholders and official staff for the drought/floods/cyclones</p>	<p>All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS. Continuous supplementation of minerals to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals)</p> <p>Subsidized loans (5-10 crores) should be provided to the livestock keepers</p>	
Drinking water	<p>Make available wholesome clean drinking water throughout the year for livestock</p> <p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Drinking water troughs should be provided in shandies /community grazing areas</p>	<p>Provide wholesome clean drinking water throughout the day</p> <p>Restrict wallowing of animals in water bodies/resources</p> <p>Add alum in stagnated water bodies</p>	<p>Watershed management practices should be promoted to conserve the rainwater.</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Desilting of ponds</p> <p>Sensitize the farming community about importance of clean drinking water for livestock</p>
Health and disease management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the area before the onset of monsoon</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on disaster management to be given to animal husbandry department staff</p> <p>Procure and stock multivitamins & area specific mineral mixture</p>	<p>Conduct mass animal health camps in every village</p> <p>Keep close watch on health of different livestock species</p> <p>Identification and quarantine of sick animals</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Tick control measures should be implemented to prevent tick borne diseases in productive animals</p> <p>Keep the animal houses clean and spray disinfectants</p> <p>Safe and hygienic disposal of dead animal carcasses</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p>

<p>Cyclone/ Floods</p>	<p>Harvest all the possible immature and or wetted grain (Pearlmillet, Pigeon pea, Sorghum, Wheat, Green gram, Black gram, maize, Soybean, cluster bean etc) and store properly for use as animal feed. Protect the stored dry roughage feed (wheat straw/sorghum stover etc.) from wetting and inundation of stagnated water Procure and stock vaccines for important endemic diseases Make available emergency medicines, anti-diarrheal drugs and electrolytes for transport to the needy areas Keep stock of bleaching powder and lime</p> <p>Don't allow the animals for grazing in case of early forewarning (EFW) Incase of EFW of severe cyclone/floods, shift the animals to safer places Surveillance and disease monitoring network to be established at Animal Husbandry Department in each district Arrange transportation facilities for animals to shift from low lying areas to safer places and also for animal health workers for rescue operations</p>	<p>Arrange relief camps to save productive and high valued animals Shift productive and high valued animals from affected areas to relief camps Carryout deworming to all the animals entering into relief camps Proper hygiene and sanitation of the relief camps, animal sheds and surroundings Avoid feeding soaked and mould infected feeds / foddors to livestock Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Spray fly repellants like neem oil, Butax etc., in animal sheds and relief camps Identification and quarantine of sick animals Perform ring vaccination (8 km radius) in case of any disease outbreak Sprinkle lime in relief camps and animal sheds Proper disposal of dung from relief camps and animal sheds</p>	<p>Restrict movement of animals in case of epidemic Repair of animal shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Deworm all the animals through mass camps Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR Proper dispose of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit Bleach / chlorinate (0.1%) drinking water or water resources Collect drowned crop material, dry it and store for future use Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio mass production.</p>
<p>Heat & Cold wave</p>	<p>Arrangement for protection from heat wave Plantation around the shed Arrangement of H2O sprinklers / foggers in the shed Application of white reflector paint on the roof Thatched sheds should be provided as a shelter to minimize heat stress Cold wave : Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)</p>	<p>Heat wave: Allow the animals early in the morning or late in the evening for grazing Feed green fodder/silage / concentrates during day time and roughages / hay during night time Put on the foggers / sprinklers during day time In severe cases, vitamin 'C' and electrolytes should be added in H2O during day time Cold wave : Allow for grazing between 10AM to 3PM Add 25-50 ml of edible oil in concentrates and fed to</p>	<p>Feed the animals as per routine schedule Allow the animals for grazing (normal timings)</p>

		the animals Put on the heaters during night time Apply / sprinkle lime powder in the animal shed to neutralize ammonia accumulation	
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals

2.5.2 Poultry

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of grain like maize, bajra, jowar, broken wheat/ rice etc, to use as supplemental feed during drought	Feed with house hold grain to all the birds in the noon i.e., after morning scavenging Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Feed supplementation to all the survival birds
Drinking water	Store adequate good quality water	Use water sanitizers and offer cool hygienic drinking water	Provide clean and hygienic drinking water
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Supplementation of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit
Floods			
Shortage of feed ingredients	In case of early forewarning of floods, shift the birds to safer place Storing of grain like maize, bajra, jowar, broken wheat/ rice etc	Use stored feed as supplement Don't allow for scavenging Culling of weak birds	Routine practices are followed Deworming and vaccination against RD
Drinking water	Protect the stored water from contamination	Use water sanitizers Offer hygienic drinking water	Provide clean and hygienic drinking water

Health and disease management	In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampicloxx etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging around the sheds Provide proper drainage facility to clear stagnated water Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness Sanitation of poultry house	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD
Cyclone			
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of grain like maize, bajra, jowar, broken wheat/ rice etc Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed
Drinking water	Protect the stored water from contamination	Use water sanitizers Offer hygienic drinking water	Provide clean and hygienic drinking water
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging around the sheds Assure supply of electricity Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against Ranikhet Disease
Heat wave			
Shelter/environment management	Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged in the shed Don't allow for scavenging during mid day	Routine practices are followed
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation with house hold grain Provide cool and clean drinking water with electrolytes and vit. C	Routine practices are followed

		In hot summer, add anti-stress probiotics in drinking water or feed	
Cold wave			
Shelter/environment management	Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters in the shed Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Deworming and vaccination against IBD	Supplementation with house hold grain Sanitation of poultry house Sprinkle lime powder (5-10g per square feet) to prevent ammonia accumulation due to dampness	Routine practices are followed

^a based on forewarning wherever available

2.5.3 Fisheries: Not applicable

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THANK YOU

