State: MAHARASHTRA
Agriculture Contingency Plan for District: BEED

1.0 District Agriculture profile				
1.1	**Agro-Climatic/ Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Deccan Plateau, Hot Semi-Arid Eco-Region (6.1)		
	Agro-Climatic Region (Planning Commission)	Western Plateau and Hills Region (IX)		
	Agro Climatic Zone (NARP)	Western Maharastra Scarcity Zone (MH-6) Centeral Maharashatra plateau Zone (MH-7)		
	List all the districts or part thereof falling under the NARP Zone	Aurangabad, Jalna, Parbhani, Hingoli, Beed, Osmanabad, Latur, Nanded, Dhule, Buldhana, Amravathi, Jalgaon, Akola, Yeotmal		
	Geographical coordinates of district	Latitude	Longitude	Altitude
		18".30' 19".30' N	74'.54 76".60' E	515 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 500431 (Maharashtra)		
	Mention the KVK located in the district	Deendayal Research Institutes , Krishi Vigyan Kendra ,Digholamba post box no 28 ,Tehsil Ambajogai, District, Beed 431 005 Krishi Vigyan Kendra, Khamgaon, Tehsil Georai, District , Beed MAU, Parbhani		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMFU, Parbhani 431 402		

1.2	**Rainfall**	Normal Rainfall (mm)	Normal rainy days (number)	Normal Onset (Specify week and month)	Normal Cessation (Specify week and month)
	SW monsoon (June - Sep) :	605.4	26	June 2nd week (MH 23)	October 2nd week (MH 40)
	NE monsoon (Oct - Dec) :	94.4	5	-	-
	Winter (Jan - Feb) :	6.5	-		
	Summer (Mar - May) :	37.1	-		
	Annual	743.4	31		

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
		1068.6	1019.0	22.9	42.7	36.6	40.8	1.3	24.4	94.9	48.1

Source: Agriculture Statistical Information Maharashtra State 2005- 2006 (Part – II)

1.4	**Major Soil types**	**Area ('000 ha)**	**Percent (%) of total geographical area**
	1.Deep black soils	332.21	29.53
	2.Medium deep black soils	130.66	11.62
	3.Shallow black soils	661.96	58.85

Source: NBSS and LUP, Nagpur

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	876	120
	Area sown more than once	175.2	
	Gross cropped area	1051.2	

1.6	**Irrigation**	Area ('000 ha)	Percent (%) of total geographical area	
	Net Irrigated area	137.70	16.0	
	Gross irrigated area	169	-	
	Rainfed area	738.3	-	
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**(%)**
	Canals (Three major projects)	03	108.92	-
	Tanks	-	-	-
	Open wells	52082	-	-
	Bore wells	-	-	-
	Lift irrigation	-	-	-
	Other sources (Farm ponds) (2007-08 to 2009-10)	3246	60.33	-
	Total	-	-	-
	No. of tractors	2613	-	-
	Pump sets	-	-	-
	Micro-irrigation (2006-07)	-		
	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	-	-	Suitable for drinking and irrigation

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

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

1.7 Area under major field crops & horticulture etc.

1.7	Major Field Crops cultivated	Area ('000 ha)							
		Kharif 2009-2010			Rabi 2007-08			Summer	Total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Pearlmillet	-	166.8	166.8	-	-	-	-	166.8
	Cotton	-	160.8	160.8	-	-		-	160.8
	Sorghum	-	48.90	48.90	-	249.4	249.4	-	298.3
	Pigeonpea	-	53.3	53.3	-	-	-	-	53.3
	Soybean	-	51.4	51.4	-	-	-	-	51.4
	Wheat	-	-	-	52.7	-	52.7	-	52.7
	Gram	-	-	-	-	39.6	39.6	-	39.6
	Safflower	-	-	-	-	11.7	11.7	-	11.7
	Sunflower	-	-	-	-	5.9	5.9	-	5.9
	Sugarcane	-	-	-	39.2	-	39.2	-	39.2

	Horticulture crops – Fruits	Total area (000 ha) (2009 – 10)
	Mango	12.29
	Sweet orange (Mosambi)	5.45
	Lemon (Kagzi Lime)	3.04
	Sapota	2.54
	Gauva	1.45
	Grape	9.97
	Banana	1.35
	Custard apple	6.23
	Other fruit crops	8.62
	Total area	24.54
	Horticulture crops – Vegetables	-
	Brinjal	4,25
	Tomato	3.31
	Okra (Bhendi)	1.84
	Cabbage	1.62
	Cauliflower	1.46
	Onion	21.27
	Other vegetables	5.52
	Total	42.85
	Medicinal and Aromatic crops	**Total area**
	Chilli	3.00
	Ginger	0.30
	Garlic	0.11

	Total	3.41
	Plantation Crops	**Total area**
		Not applicable
	Fodder crops	**Total area**
	Sorghum	Not available
	Maize	-do-
	Total fodder crop area	-do-
	Grazing land	-do-
	Sericulture etc (Mulbery)	0.33
	Others (Specify)	

Source: ZREAC, Report Rabi 2010, DSAO, Beed

1.8	**Livestock**	**Number ('000)**		
	Cattle	602.281		
	Buffaloes total	215.824		
	Commercial dairy farms	NA		
	Goat	457.080		
	Sheep	121.925		
	Others (Camel, pig, Yak etc.)	NA		
1.9	**Poultry**	-		
	Commercial	794.105		
	Backyard	0		
1.10	**Fisheries**	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water	NA	-	-
	Fresh water	20595	0.194	4000
	Others	NA	-	-

Source: Maharashtra Animal and Fishery Sciences University, Nagpur

	Production and Productivity of major crops (2003-2008)	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	163.6 Bales	296 Lint	-	-	-	-	163.6 Bales	296 Lint
	Pearlmillet	1314.1	788	-	-	-	-	1314.1	788
	Sorghum	591.6	1225	-	-	-	-	591.6	1225
	Pegionpea	353.4	719	-	-	-	-	353.4	719
	Soybean	536.6	1123	-	-	-	-	536.6	1123
	Wheat	-	-	66.9	1271	-	-	66.9	1271

	Gram	-	-	26.2	602	-	-	26.2	602
	Safflower	-	-	12.3	558	-	-	12.3	558
	Sunflower	-	-	7.9	498	-	-	7.9	498
	Sugarcane	2273.6	58000	-	-	-	-	2273.6	58000
	Major Horticultural crops								
	Mango	48.60	5000	-	-	-	-	48.60	5000
	Mosambi	68.426	8000	-	-	-	-	68.426	8000
	Lime	23.982	6000	-	-	-	-	23.982	6000
	Grape	15.497	15000	-	-	-	-	15.497	15000
	Gauva	23.628	15000	-	-	-	-	23.628	15000
Source: Regional Review Meeting Report, 2010-2011 Agril. Department Govt. of Maharashtra and DSAO report 2006-07									

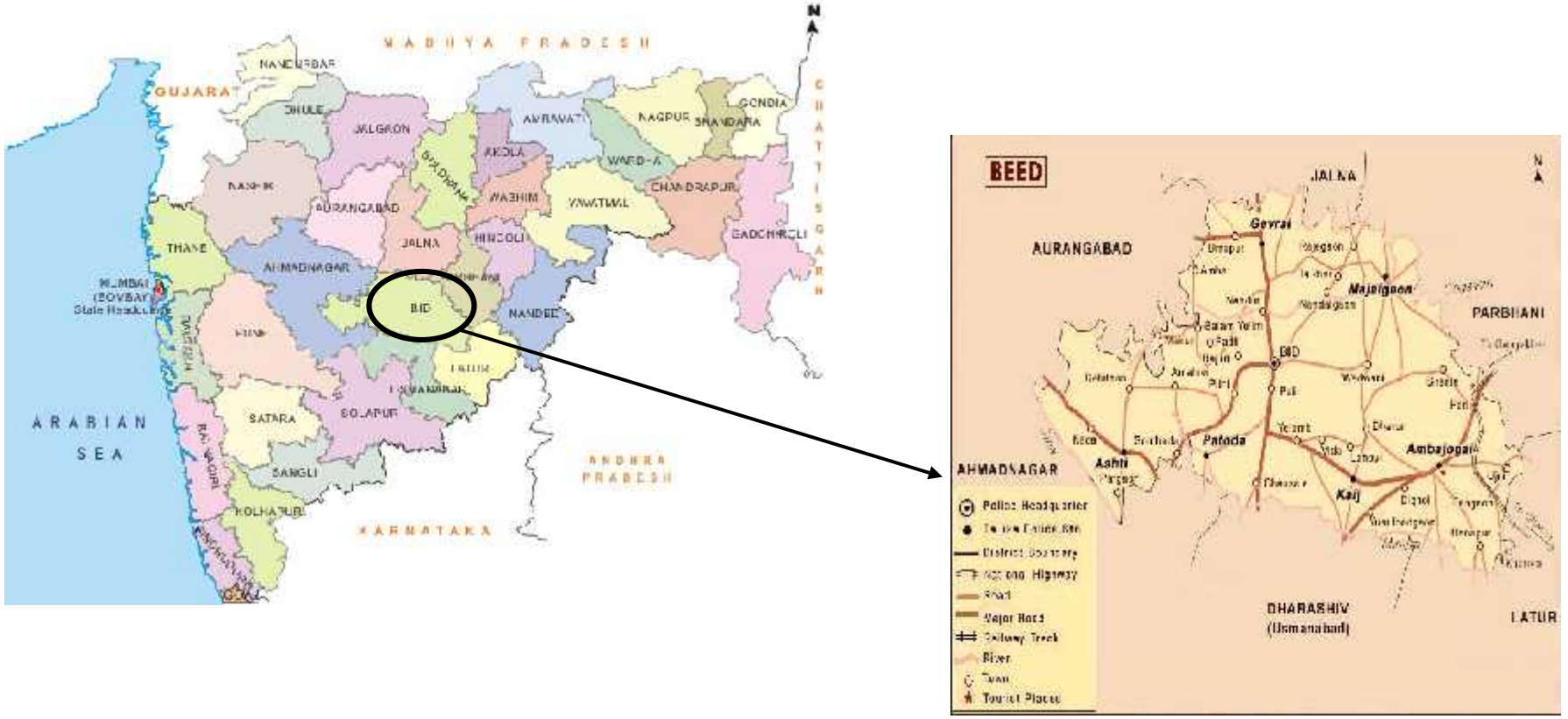
1.12	**Sowing window for 5 major crops (start and end of sowing period)**	Cotton	Bajra	Sorghum	Pigeon pea	Soybean
	Kharif - Rainfed	15 June to 15 July	15 June to 30 July	15 June to 15 July	15 June to 30 July	15 June to 15 July
	Kharif - Irrigated	May 15 to June 15	-	-	-	-
		Wheat	Gram	Sorghum	Safflower	-
	Rabi - Rainfed	-	Oct 1 – 15 Oct	Oct 1 to 15	Sep 25 to 0ct 15	-
	Rabi – Irrigated	1st Nov. 20 th Nov	15 Oct to 15 Nov	15 Oct to 15 Nov	15 Oct to 15 Nov	-

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 intrusion	-	-	√
	Pests and diseases		√ 1.Heliothis (pigeonpea , gram) 2.Spodoptera (Soybean) 3.Sphingid (Moong and Urd) 4.Jassids&whitefly (cotton)	

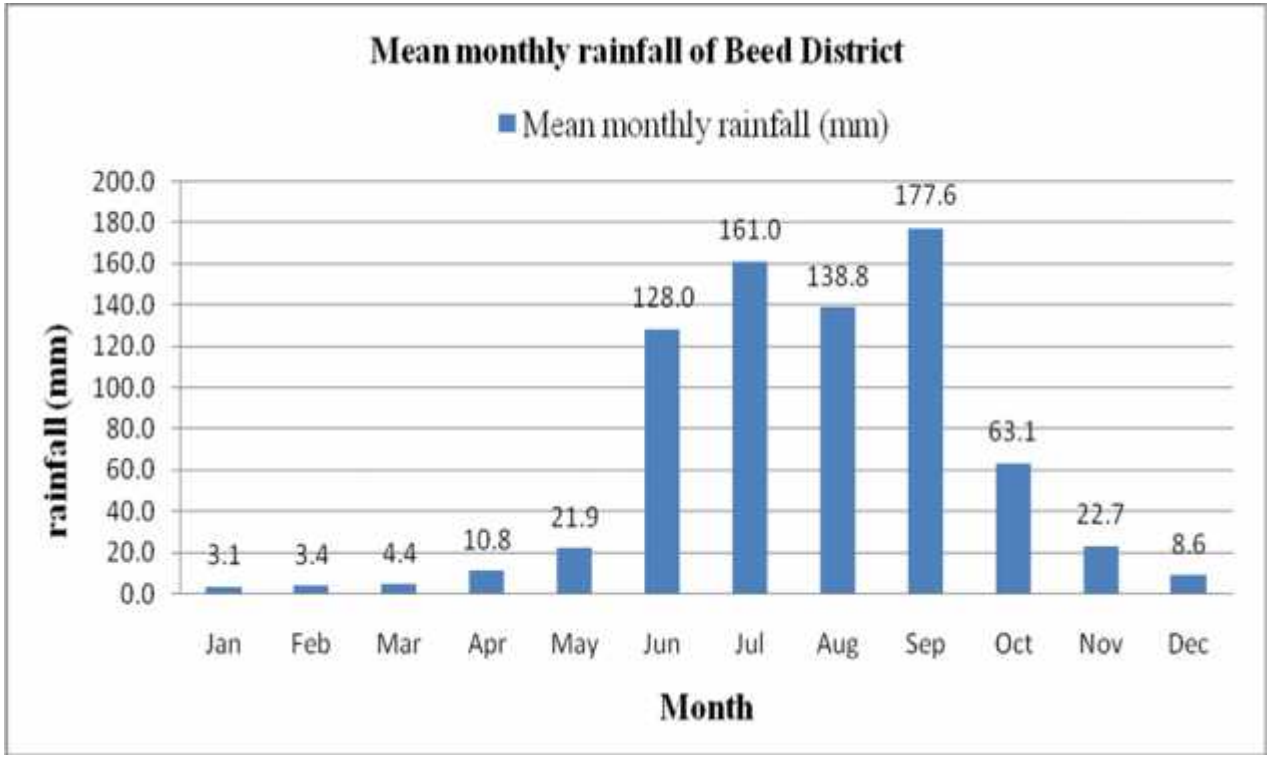
1.14	**Include Digital maps of the district for**	Location map of district within States as Annexure 1	Enclosed : Yes
		Mean annual rainfall as Annexure 2	Enclosed : Yes
		Soil map as Annexure 3	Enclosed : Yes

Annexure 1

Location map of Beed district

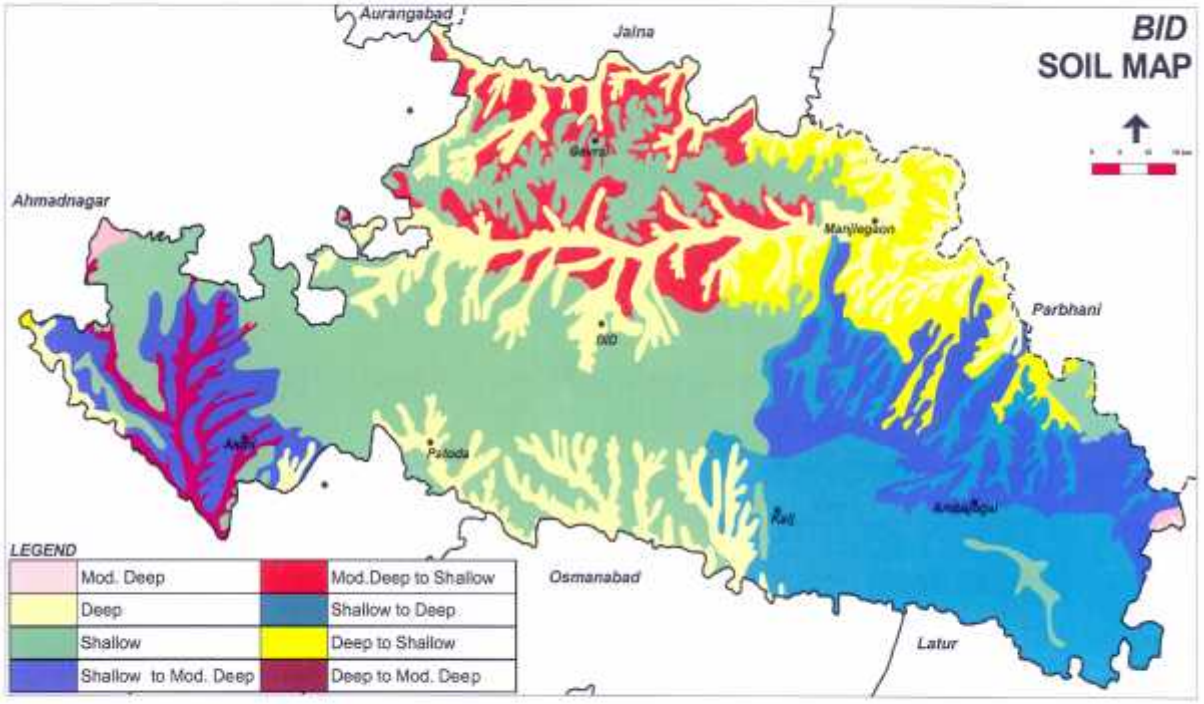


Annexure 2
Mean monthly rainfall of Beed district



(Source: IMD) (1941-1990)

Annexure 3
Soil map of Beed district



Source: NBSS & LUP Regional Centre, Nagpur

2.0 Strategies for weather related contingencies
2.1 Drought
2.1.1 Rainfed situation

Early season drought (delayed onset)	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
			Change in Crop/Cropping system	Agronomic measures	Remarks on Implementation
Delay by 2 weeks 4th week of June	Medium deep to deep black soils with assured rainfall	Pearl millet	No Change	Normal package of practices recommended by MAU, Parbhani	Linkage with MAU, Parbhani, MSSC, NSC for supply of seed
		Cotton	No Change	-do-	
		Sorghum	No Change	-do-	
		Pigeonpea	No Change	-do-	
		Soybean	No Change	-do-	
	Shallow soils with assured rainfall	Pearl millet / Pearl millet + Pigeonpea	No Change	-do-	
		Sorghum	No Change	-do-	
		Pigeonpea	No Change	-do-	
		Soybean	No Change	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	No Change	-do-	
		Cotton	No Change	-do-	
		Sorghum	No Change	-do-	
		Pigeonpea	No Change	-do-	
		Soybean	No Change	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Khasa tehsils)	Pearl millet / Pearl millet + Pigeonpea	No Change	-do-	
		Sorghum	No Change	-do-	
		Pigeonpea	No Change	-do-	
		Soybean	No Change	-do-	

Condition	Major Farming situation	Normal Crop/Cropping system including variety	Suggested Contingency measures		
Early season drought (delayed onset)			Normal Change in Crop/Cropping system including variety	Agronomic measures	Remarks on Implementation
Delay by 4 weeks	Medium deep to deep black soils	Pearl millet	No change. Prefer varieties like ICTP-8203, GHB 558, AIMP-92901,	Seed treatment	• Linkage with

2nd week of July	with assured rainfall		Shardha Saburi		MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Cotton	Cotton + Pigeonpea in 6:1 row proportion (Bt cotton hybrids like Bunny, Mahyco, Ankur, Ajit 51)	• Use 10% higher seed rate • Follow *in situ* soil moisture conservation measures like alternate furrow opening with Balaram plough	
		Sorghum	Sorghum (CSH-9, 11,16, PVK-401, 809) + Pigeonpea MAUS-47 / 71, BSMR 736 / 853) in 4: 2 row proportion	• Normal package of practices recommended by MAU, Parbhani	
		Pigeonpea	Soybean (JS-335, MAUS-71) + Pigeon pea (BSMR 736, 853, BDN-708, 711) in 4:2 or 6:3 row proportion	-do-	
		Soybean	Soybean (JS-335, MAUS-71) + Pigeon pea (BSMR 736, 853, BDN-708, 711) in 4:2 or 6:3 row proportion	-do-	
	Shallow soils with assured rainfall	Pearl millet / Pearl millet + Pigeonpea	No change. Prefer varieties like ICTP-8203, GSB 558, AIMP-92901 Shardha, Saburi	-do-	
		Sorghum	Sorghum (CSH-9, 11,16 ,PVK-401, 809) + Pigeon pea (BSMR 736, 853, BDN-708, 711) in 4 : 2 row proportion	-do-	
		Pigeonpea	Soybean (JS-335, MAUS-71) + Pigeon pea (BSMR 736, 853, BDN-708, 711) in 4 : 2 row proportion	-do-	
		Soybean	Soybean (JS-335, MAUS-71) + Pigeon pea (BSMR- 736, 853, BDN-708, 711) in 4 : 2 or 6:3 row proportion	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	No change. Prefer varieties like ICTP-8203, GHB- 558, AIMP-92901, Shardha, Saburi	-do-	
		Cotton	Cotton + Pigeon pea in 6:1 row proportion (Bt cotton hybrids like bunny, mahyco, ankur, ajit 51)	Follow *in situ* soil moisture conservation measures like alternate furrow opening with Balaram plough	
		Sorghum	Sorghum + Pigeonpea in 4 : 2 row proportion, (MAUS-47 / 71 + BSMR	Normal package of practices recommended by MAU,	

			736, 853)	Parbhani	
		Pigeonpea	Soybean (JS-335, MAUS-71)+ Pigeon pea (BSMR- 736, 853, BDN-708, 711) in 4 : 2 row proportion	-do-	
		Soybean	Soybean (JS-335, MAUS-71)+ Pigeon pea (BSMR- 736, 853, BDN-708, 711) in 4 : 2 or 6:3 row proportion	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Kasar tehsils)	Pearl millet / Pearl millet + Pigeonpea	No change	Normal package of practices recommended by MAU, Parbhani	
		2.Sorghum	No change. Prefer varieties like CSH-9, 11,16, PVK-401, 809	-do-	
		3.Pigeonpea	No change. Prefer varieties like BSMR 853, BDN- 708, 711	-do-	
		4.Soybean	No change. Prefer intercropping with pigeonpea in 4:2 or 6:3 row proportion	-do-	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/Cropping system including variety**	**Change in Crop/Cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 4th week of July	Medium deep to deep black soils with assured rainfall	Pearl millet	Pearl millet (ICTP-8203, GHB- 558, AIMP-92901, shardha ,Saburi) + Pigeon pea (BSMR 853, 853, BDN-708, 711) in 4:2 or 3:3 row proportion	• Normal package of practices recommended by MAU, Parbhani • Conservation furrow, • Inter cultivation (Hoeing, weeding)	Supply of seed cum fertilizer drill under RKVY, ZILLA PARISHAD, MAIDC
		Cotton	Hybrid Maize (Decalp, Kargil, Maharaja)	Wider spacing (60 x 30 cm) for maize crop	
		Sorghum	Pigeon pea (BSMR 853, BDN-708, 711)	Give protective irrigation during drought, experienced either at flowering and grain filling stages	
		Pigeonpea	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1)	Normal package of practices recommended by MAU, Parbhani	

		Soybean	Pearl millet (ICTP-8203, GHB 558, AIMP-92901, Shradha, Saburi) + Pigeon pea (BSMR 853, 708, BDN-708, 711) in 4:2 or 3:3 row proportion	-do-	
	Shallow soils with assured rainfall	Pearl millet / Pearl millet + Pigeonpea	Prefer Pearl millet + Pigeonpea intercropping in 4:2 or 3: 3 row proportion	-do-	
		Sorghum	Pigeon pea BSMR 853, 708, BDN-708, 711)	-do-	
		Pigeonpea	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1)	-do-	
		Soybean	Pearl millet (ICTP-8203, GHB- 558, AIMP-92901, Shradha, Saburi) + Pigeon pea (BSMR 853, 708, BDN-708, 711) in 4:2 or 3:3 row proportion	-do-	
	Medium deep to deep black soils with low rainfall (Asthi , patoda & Sirur kasar tehsils)	Pearl millet	Pearl millet + Pigeon pea in 4:2 or 3:3 row proportion, Niger local, Sesamum (No- 85, JLT-7), Fodder Sorghum (Nilwa, MP Chari, Pusa Chari)	-do-	
		Cotton	Castor (VI-9, Aruna, DCS-9 (Jyoti),GCH-4, 5, 6 and DCH-117, 32)	-do-	
		Sorghum	Pearl millet + Pigeon pea in 4:2 or 3:3 row proportion	-do-	
		Pigeonpea	Pigeon pea (BDN-708, 711), Sunflower (Morden, SS-56, LSH-36, Mahyco-17, BSH-1)	-do-	
		Soybean	Pearlmillet (PPC-6, AIMP-92901 , Shradha, Saburi), Sesamum, Panjab-1 Castor (VI-9, Aruna, DCS-9 (Jyoti), GCH-4, 5, 6 and DCH-117, 32)	-do-	
	Shallow soils with low rainfall (Asti, Patoda & Sirur Kasar tehsils)	Pearl millet	No change	Normal package of practices recommended by MAU, Parbhani	
		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-	
		Pigeonpea	Prefer varieties like BSMR 736, 853, BDN 708, 711	-do-	
		Soybean	Prefer intercropping with pigeonpea in 4:2 or 6:2 row proportion	-do-	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/Cropping system including variety**	**Change in Crop/Cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks 2nd week of Aug	Medium deep to deep black soils with assured rainfall	Pearl millet	Pearl millet + Pigeon pea (BDN-708, 711) in 4:2 or 3:3 row proportion	• Dry sowing 8 - 10 days before rains with 15 - 20 % higher seed rate. • Seed hardening i.e. 18 hrs soaking in water followed by 24 hrs shade drying. • Open conservation furrow for every 6-8 rows with Balaram plough. • Intercultivation (Hoeing, weeding) and mulching.	• Linkage with MAU, MSSC and NSC for seed • Linkage with MAIDC for implements • Linkage with MAU, KVK for agro-techniques
		Cotton	Hybrid Maize (Decalp, Kargil, Maharaja)	Follow *in situ* soil moisture conservation measures like alternate furrow opening with Balaram plough.	
		Sorghum	Pigeon pea (BDN-708, 711)	Open conservation furrow for every 6-8 rows with Balaram plough.	
		Pigeonpea	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1)	-do-	
		Soybean	Pearl millet (ICTP-8203, GSB 558, AIMP-92901 shardha, Saburi) + Pigeon pea (BDN-708, 711) in 4:2 or 3:3 row proportion	-do-	
	Shallow soils with assured rainfall	Pearl millet	Hybrid Maize (Decalp, Kargil, Maharaja)	-do-	
		Sorghum	Pigeon pea (BDN-708, 711)	-do-	
		Pigeonpea	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1), Castor (VI-9, Aruna, DCS-9 (Jyoti) GCH-4, 5, 6 and DCH-117, 32)	-do-	
		Soybean	Pearl millet + Pigeon pea in 4:2 or 3:3 row proportion, Niger local, Sesamum (No- 85, JLT-7),	-do-	

			Fodder Sorghum (Nilwa, MP Chari, Pusa Chari), Fodder maize (African tall), Castor (VI-9, Aruna, DCS-9 jyoti),GCH-4, 5, 6 and DCH-117, 32)		
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	Pearl millet + Pigeon pea in 4:2 or 3: 3 row proportion	-do-	
		Cotton	Pigeon pea (BDN-708,711) Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1), Castor (VI-9, Aruna, DCS-9 (Jyoti),GCH-4, 5, 6 and DCH-117, 32), Sesamum, (Punjab-1)	Follow *in situ* soil moisture conservation measures like alternate furrow opening with Balaram plough.	
		Sorghum	Pearl millet (PPC-6, Shradha, Saburi), sesamum, (Punjab-1) Castor (VI-9, Aruna, DCS-9 (Jyoti),GCH-4, 5, 6 and DCH-117, 32),	Open conservation furrow for every 6-8 rows with Balaram plough	
		Pigeonpea	Castor (VI-9, Aruna, GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Soybean	Pearl millet / Sunflower	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Khasar tehsils)	Pearl millet / Pearl millet + Pigeonpea	No change. Prefer intercropping with pigeonpea	-do-	
		Sorghum	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1)	-do-	
		Pigeonpea	Castor (VI-9, Aruna, DCS-9 (Jyoti), GCH-4, 5, 6 and DCH-117 / 32)	-do-	
		Soybean	Sunflower (Morden, SS-56, LSH-36, Mahico-17, BSH-1)	-do-	

Condition	**Major Farming situation**	**Normal Crop/Cropping system**	**Suggested Contingency measures**		
Early season drought (Normal onset)			**Crop management**	**Soil nutrient & moisture Conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing germination / crop stand etc.	Medium deep to deep black soils with assured rainfall	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with harrow / hoe.	• Linkage with MAU, MSSC and NSC for seed. • Linkage with
		Cotton	• Gap filling within the rows with	• Avoid applying fertilizers	

			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	till sufficient soil. moisture is available • Interculture with harrow/hoe	MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Sorghum	Gap filling with pearl millet / pigeonpea	Interculture with harrow/ hoe.	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	• Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population • If the plant population is less than 50% go for re-sowing of the crop	-do-	
	Shallow soils with assured rainfall	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with harrow/hoe.	
		Sorghum	Gap filling with pigeonpea	-do-	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	• Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population • If the plant population is less than 50% go for re-sowing of the crop	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & sirur kasar tehsils)	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	-do-	
		Cotton	• Gap filling within the rows with same cultivar or pigeonpea to maintain at least 75% plant	• Avoid applying fertilizers till sufficient soil. moisture is available	

			population. • Raise cotton seedlings in polythene bags and transplant when sufficient soil moisture is available. • Give protective irrigation wherever possible	• Interculture with harrow / hoe	
		Sorghum	Gap filling with pearl millet / pigeonpea	Interculture with harrow / hoe	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	• Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population • If the plant population is less than 50% go for re-sowing of the crop	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Khasa r tehsils)	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Interculture with harrow / hoe	
		Sorghum	Gap filling with pearl millet / pigeonpea	-do-	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	• Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population • If the plant population is less than 50% go for re-sowing of the crop	-do-	

Condition	Major Farming situation	Normal Crop/Cropping system	Suggested Contingency measures		
Early season drought (Normal onset)			**Crop management**	**Soil nutrient & moisture Conservation measures**	**Remarks on Implementation**
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period) At vegetative stage	Medium deep to deep black soils with assured rainfall	Pearl millet	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Interculture with harrow for weeding and to create soil mulch. • Give protective irrigation if possible	• Opening of alternate furrows with Balaram plough. • Mulching with crop residue @ 3-5 t /ha within the rows • Spraying of 2% urea or DAP	• Linkage with MAU, MSSC and NSC for seed. • Linkage with MAIDC for implements. • Linkage with MAU, KVK for agro techniques
		Cotton	-do-	-do-	
		Sorghum	• Avoid top dressing of fertilizers till sufficient soil moisture is available. • Protective irrigation if possible • Intrarow thinning	-do-	
		Pigeonpea	-do-	-do-	
		Soybean	Interculture for weeding and to create soil mulch.	-do-	
	Shallow soils with assured rainfall	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	• Opening of alternate furrows with Balaram plough. • Interculture with hoe.	
		Sorghum	Gap filling with pigeonpea	-do-	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	-do-	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	• Opening of alternate furrows with Balaram plough. • Interculture with hoe.	
		Cotton	• 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	• Avoid applying fertilizers till sufficient soil. moisture is available • Opening of alternate furrows with Balaram plough. • Interculture with harrows	

			available. • Give protective irrigation wherever possible		
		Sorghum	Gap filling with pearl millet / pigeonpea	• Opening of alternate furrows with Balaram plough • Interculture with hoe	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	-do- or if the plant population is less than 50% resow the crop	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Kasar tehsils)	Pearl millet	Gap filling or transplanting of seedlings either from the same field or from nursery or gap filling with pigeonpea	Opening of alternate furrows with Balaram plough Interculture with hoe.	
		Sorghum	Gap filling with pearl millet / pigeonpea	-do-	
		Pigeonpea	Gap filling within the rows with same or short duration cultivar to maintain at least 75% plant population	-do-	
		Soybean	-do- or if the plant population is less than 50% re-sow the crop	-do-	

Condition	**Major Farming situation**	**Normal Crop/Cropping system**	**Suggested Contingency measures**		
Mid season drought (long dry spell)			**Crop management**	**Soil nutrient & moisture Conservation measures**	**Remarks on Implementation**
At flowering/fruiting stage	Medium deep to deep black soils with assured rainfall	Pearl millet	Give protective irrigation	Foliar spray of 2% urea and DAP	• Linkage with MAIDC / DSAO for intercultural implements (Harrow, hoe). • Linkage with RKVY for farm ponds and micro irrigation system.
		Cotton	Give protective irrigation with drip	• Foliar spray of 2% KNO_3, urea and DAP. • Mulching with crop residue @ 3-5 t /ha within the rows.	
		Sorghum	Give protective irrigation	If feasible spray anti-transparent 6% kaolin	
		Pigeonpea	-do-	Foliar spray of 2% KNO_3, urea and DAP	
		Soybean	Give protective irrigation with sprinkler	-do-	
	Shallow soils	Pearl millet /	Give protective irrigation	-do-	

	with assured rainfall	Pearl millet + Pigeonpea			
		Sorghum	• Give protection irrigation • In case of severe stress harvest as green fodder	If feasible spray anti-transparent 6% kaolin	
		Pigeonpea	Give protective irrigation	Foliar spray of 2% urea, DAP	
		Soybean	-do-	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	Give protective irrigation	-do-	
		Cotton	Give protective irrigation with drip	• Foliar spray of 2% KNO_3, urea, DAP, DAP, MgSo4, Zinc, Boron. • Mulching with crop residue @ 3-5 t /ha within the rows	
		Sorghum	-do-	Foliar spray of 2% urea, DAP	
		Pigeonpea	-do-	-do-	
		Soybean	-do-	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Kasar tehsils)	Pearl millet / Pearl millet + Pigeonpea	-do-	-do-	
		Sorghum	• Give protection irrigation • In case of severe stress harvest as green fodder	• If feasible spray anti-transparent 6% kaolin. • Foliar spray of 2% urea, DAP	
		Pigeonpea	Give protection irrigation	Foliar spray of 2% urea and DAP	
		Soybean	-do-	-do-	

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	Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	Linkage with RKVY for farm ponds and micro irrigation system.
		Cotton	• Life saving irrigation with drip • Picking	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	
		Sorghum	Life saving irrigation or harvest at physiological maturity or harvest for fodder	Plan for rabi crops chickpea / safflower	
		Pigeonpea	Life saving irrigation	-do-	

		Soybean	-do-	-do-	
	Shallow soils with assured rainfall	Pearl millet / Pearl millet + Pigeonpea	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	
		Sorghum	• 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	
		Soybean	-do-	-do-	
	Medium deep to deep black soils with low rainfall (Asthi, patoda & Sirur kasar tehsils)	Pearl millet	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower	
		Cotton	• Life saving irrigation with drip • Picking	If possible, adopt relay cropping of chickpea, safflower, rabi sorghum	
		Sorghum	Life saving irrigation or harvest at physiological maturity	-do-	
		Pigeonpea	Life saving irrigation	-do-	
		Soybean	-do-	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Khasar tehsils)	Pearl millet / Pearl millet + Pigeonpea	Life saving irrigation or harvest at physiological maturity	Plan for rabi crops chickpea / safflower after harvest of sole pearl millet	
		Sorghum	• 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	
		Soybean	-do-	Plan for rabi crops chickpea / safflower / sorghum	

2.1.2 Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/Cropping system**	**Change in crop / cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or irrigated cotton	• 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	Supply of seed through MSSC, NFSM, MAU, Village seed production programme
		Turmeric	No change	Use drip irrigation	
	Shallow black soils with assured rainfall	Sweet orange	No change	• Drip irrigation • Basin mulch	
		Ginger	Rabi onion / summer pearl millet	Use drip irrigation	
		Vegetable crops	Cotton / Maize	-do-	
	Shallow soils with low rainfall (Asthi, patoda & Sirur Khasar tehsils)	Vegetable crops	Cotton / Fodder maize	-do-	
		Ginger	No change	-do-	
		Kharif Onion	Semi Rabi Onion	-do-	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/Cropping system**	**Change in crop / cropping system**	**Agronomic measures**	**Remarks on Implementation**
Limited release of water in canals due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or irrigated cotton	• 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	Supply of seed through MSSC, NFSM, MAU, Village seed production programme

	Shallow black soils with assured rainfall	Ginger / Turmeric	Cotton / Maize / Wheat / Chickpea	• Irrigation at critical crop growth stages • Use drip / sprinkler	

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	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or cotton	• 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	• Supply of seed through MSSC, NFSM, MAU, Village seed production programme
	Shallow black soils with assured rainfall	Ginger / Turmeric	Cotton / Maize / Wheat / Chickpea	• Irrigation at critical crop growth stages • Use drip / sprinkler irrigation	

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/Cropping system**	**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			

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/Cropping system**	**Change in crop / cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Medium deep to deep black soils with assured rainfall	Sugarcane	No change or cotton	• Raising of nurseries with single budded sets 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	Supply of seed through MSSC, NFSM, MAU, Village seed production programme
		Ginger / Turmeric	Cotton / Maize / Wheat / Chickpea	• Irrigation at critical crop growth stages • Use drip / sprinkler irrigation	
	Shallow black soils with assured rainfall	Ginger / Turmeric	Cotton / Maize / Wheat / Chickpea	• Irrigation at critical crop growth stages • Use drip / sprinkler irrigation	
	Medium deep to deep black soils with low rainfall (Asthi, Patoda & Sirur kasar tehsils)	Sugarcane	No change or cotton	• Raising of nurseries with single budded sets 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	
		Ginger / Turmeric	Cotton / Maize / Wheat / Chickpea	• Irrigation at critical crop growth stages • Use drip / sprinkler irrigation	
	Shallow soils with low rainfall (Asthi, Patoda & Sirur Khasar tehsils)	Wheat	Safflower / Chickpea	• Mulching • Use drip / sprinkler irrigation • Irrigation at critical crop growth stages	
		Turmeric / Ginger	Pigeonpea	-do-	
Any other condition (specify)		Not applicable			

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity Stage**	**Post harvest**
Cotton, Pearl millet	• Drain excess water • Interculture at optimum soil moisture • Apply 25KgN/Ha to cotton	Drain excess water	Drain out excess water Timely harvest	Protect picked cotton from drenching and soiling Dry wet cotton and market
Soybean, Pigeonpea and short duration pulses	Drain out excess water	-do-	-do-	Shift to safer place Dry the produce
Horticulture				
Mango	Opening of field channels to drain out excess water and avoid surface ponding, Interculture at optimum soil moisture	Opening of field channels to drain out excess water and avoid surface ponding, Interculture at optimum soil moisture	Collect fallen fruits, grade and market if feasible	Grading, cleaning and marketing of fruits
Sweet orange	-do-	-do-	-do-	-do-
Heavy rainfall with high speed winds in a short span				
Cotton, Pearl millet	• Drain excess water • Interculture at optimum soil moisture • Apply 25KgN/Ha to cotton	Drain excess water	Drain out excess water Timely harvest	Protect picked cotton from drenching and soiling Dry wet cotton and marketing
Soybean, Pigeonpea and short duration pulses	Drain out excess water	-do-	-do-	Shift to safer place Dry the produce
Horticulture				
Mango	-	Provide support to prevent lodging and uprooting in young orchards	Apply multinutrient and hormonal spray to promote flowering	Shift produce to safer place
Sweet orange	-do	-do-	-do-	-do-
Outbreak of pests and diseases due to unseasonal rains				
Cotton	• Apply soil drench of carbendazim 0.1% or COC @ 3g/litre at base of	• Apply foliar spray of streptocycline sulphate @ 6g/60 litre + COC @	Foliar spray of carbendazim 0.1% or Ditane M45 0.2% to prevent boll rot	-

	plants to prevent wilt in low lying patches	25g/10 litre to prevent bacterial leaf blight • Apply Sulphur 25g/10 litre (300 mesh) to prevent grey mildew • Apply MgSO4 25 kg/ha soil application or 1% MgSO4 foliar spray to prevent leaf reddening		
Pearl millet			Apply Dithane M 45 0.2% on ear heads immediately after cessation of rains	
Soybean	• Manually remove infested plants or plant parts from below the girdles • Protect against semilooper when density reaches >4 larvae per meter row with foliar spray of NSKE 5% or dimethoate 30 EC 1 ml/litre	-		
Horticulture				
Mango	• Spray imidacloprid 0.3 ml or dimethoate 1 ml/liter to control hopper • Drench the seedlings with COC 0.25% against root rot	Protect against hopper	• Spray Dithane M 45 3g/litre or carbendazim 1g/liter against anthracnose • Spray sulphur 0.5% to control powdery mildew	Maintain aeration in storage to prevent fungal infection and blackening or fruits
Sweet orange	Protect against Citrus Psylla with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25EC 4 ml per 10 liters	Protect against Citrus Psylla with foliar spray of malathion 50 EC 10 ml or quinalphos 25 EC 10 ml or cypermethrin 25EC 4 ml per 10 liters	-	-

2.3 Floods: Not applicable

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

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	Not applicable			
Cold wave	Not applicable			
Frost	Not applicable			
Hailstorm	Not applicable			
Cyclone	Not applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			
Feed and fodder availability	Sowing of cereals (Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production Collection of soya meal waste and sunflower/safflower/ groundnut seed cake for use as feed supplement during drought Motivating the sugarcane farmers to convert green sugarcane tops in to silage by the end of February Preserving the green maize fodder as silage Development of hortipastoral systems inexisting orchards Establishment of fodder bank at village level with available dry fodder (wheat straw, Sorghum/ Bajra stover, groundnut haulms, sugarcane tops)	Harvest and use biomass of dried up crops (Pearlmillet, Pigeon pea, Sorghum, maize, Wheat, Green gram, Black gram, Soybean, cluster bean) material as fodder 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 Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought 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 Promotion of Horse gram as contingent crop and	Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAINT BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with input subsidy Supply of quality seeds of COFS 29, Stylo and fodder slips of Marvel, Yaswant, Jaywant, Napier, guinea grass well before monsoon Flushing the stock to recoup

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

Cyclone/ Floods	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 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	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 / fodders to livestock Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers. 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	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.
Heat & Cold wave	Arrangement for protection from **heat wave** i) Plantation around the shed ii) Arrangement of H_2O sprinklers / foggers in the shed **iii)** Application of white reflector paint on the roof **iv)** 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	**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 H_2O during day time **Cold wave :** Allow for grazing between 10AM to 3PM Add 25-50 ml of edible oil in concentrates and fed to	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)

	mechanism for lifting during the day time and putting down during night time)	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/ Ampiclox 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 line 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 In hot summer, add anti-stress probiotics in drinking water or feed	Routine practices are followed
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