State: Uttar Pradesh

Agriculture Contingency Plan for District: MAHOBA

1.0 District Agriculture profile				
1.1	Agro-Climatic/ Ecological Zone			
	Agro-Ecological Sub Region(ICAR)	Central Plain Zone		
	Agro-Climatic Zone (Planning Commission)	Central Plateau and Hills Region.		
	Agro-Climatic Zone (NARP)	Bundelkhand zone(U.P-10)		
	List all the districts falling the NARP Zone* (^ 50% area falling in the zone)	Lalitpur, Jhanshi, Jallaun, Chitrakut, Mahoba, Banda and Hamirpur		
	Geographical coordinates of district headquarters	Latitude	Longitude	Altitude(mt)
		25° 18' N	79° 55' E	
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS			
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Zonal Agricultural Research Station, Belatal, PO.Jaitpur, Mahoba		
	Name and address of the nearest Agromet Field Unit(AMFU,IMD)for agro advisories in the Zone	Bharari Jhansi, C. S. A Kanpur		

1.2	Rainfall	Normal RF (mm)	Normal Rainy Days (Number)	Normal Onset (Specify week and month)	Normal Cessation (Specify week and month)
	SW monsoon (June-sep)	768.7	45	3rd week of June	3rd week of September
	Post monsoon (Oct-Dec)	38.2	6		
	Winter (Jan-March)	33.4	2	-	-
	Pre monsoon (Apr-May)	10.4	1	-	-
	Annual	850.7	54		

1.3	Land use pattern of the district (Latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc.tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area in (000 ha)	327.4	264.1	16.2	38.8	0.5	10.3	0.7	7.8	11.6	6.0

1.4	Major Soils	Area(‘000 ha)	Percent(%) of total
	Rakar Soil		
	Parwa soils		
	Kabar soils		
	Maar soils		

1.5	Agricultural land use	Area(‘000 ha)	Cropping intensity (%)
	Net sown area	235.7	121 %
	Area sown more than once	84.0	
	Gross cropped area	319.7	

1.6	Irrigation	Area(‘000 ha)		
	Net irrigation area	100.8		
	Gross irrigated area	101.6		
	Rain fed area	134.9		
	Sources of irrigation (Gross Irr. Area)	Number	Area(’000 ha)	Percentage of total irrigated area
	Canals	-	26.2	25.8
	Tanks	-	16.7	16.4
	Open wells	-	53.7	52.9
	Bore wells(Tube wells)	-	4.8	4.8
	Lift irrigation schemes	-	NA	
	Micro-irrigation	-	NA	
	Other sources	-	0.1	0.1
	Total Irrigated Area	-	101.6	
	No. of Pump sets (2011-12)	1338		
	No. of Tractors	7034		
	Groundwater availability and use* (Data source: State/ Central Ground water Department/ Board)	No of blocks- Tehsils-	(%)area	Quality of water
	Over exploited	2		
	Critical	1		
	Semi-critical	1		
	Safe			
	Waste water availability and use			
	Ground water quality			
*over-exploited groundwater utilization> 100%; critical: 90-100%; semicritical:70-90%; safe:<70%				

1.7 Area under major field crops & (As per latest figures 2011-12)

1.7	Major field crops cultivated	Area('000 ha)							
		Kharif			Rabi			Summer	Total
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
	Wheat	-	-	-	55.2	16.7	71.9	-	71.9
	Gram	-	-	-	18.9	46.5	65.4	-	65.4
	Sesame	0	30.6	30.6	-	-	-	-	30.6
	Masoor	-	-	-	0.1	28.5	28.6	-	28.6
	Pea	-	-	-	17.3	7.9	25.2	-	25.2
	Jowar	0	4.2	4.2	-	-	-	-	4.2

	Horticulture crops -Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	0.002	0.002	-
	Guava	0.003	0.003	-
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed
	Potato	0.2	0.2	-
	Onion	0.03	0.03	-
	Pea	10.6	10.6	-

1.7	Major Area in Fodder crops	Area(ha)	Total
	Kharif	93	93
	Rabi	58	58
	Summer	0	0
	Total	151	151

1.8 Production and productivity of major crops (Average of last 5 years)

1.7	Major field crops cultivated	Area(‘000 ha)								
		Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production (‘000 T)	Productivity (KG/HA)	Production (‘000 T)	Productivity (KG/HA)	Production (‘000 T)	Productivity (KG/HA)	Production (‘000 T)	Productivity (KG/HA)	
	Juar	3.5	620	-	-	-	-	3.5	620	NA
	Wheat	-	-	97.7	1573	-	-	97.7	1573	NA
	Gram	-	-	57.0	922	-	-	57.0	922	NA
	Pea	-	-	18.9	829	-	-	18.9	829	NA
	Masoor	-	-	14.0	540	-	-	14.0	540	NA
	Sesame	2.4	98	-	-	-	-	2.4	98	NA

1.9 Live stock

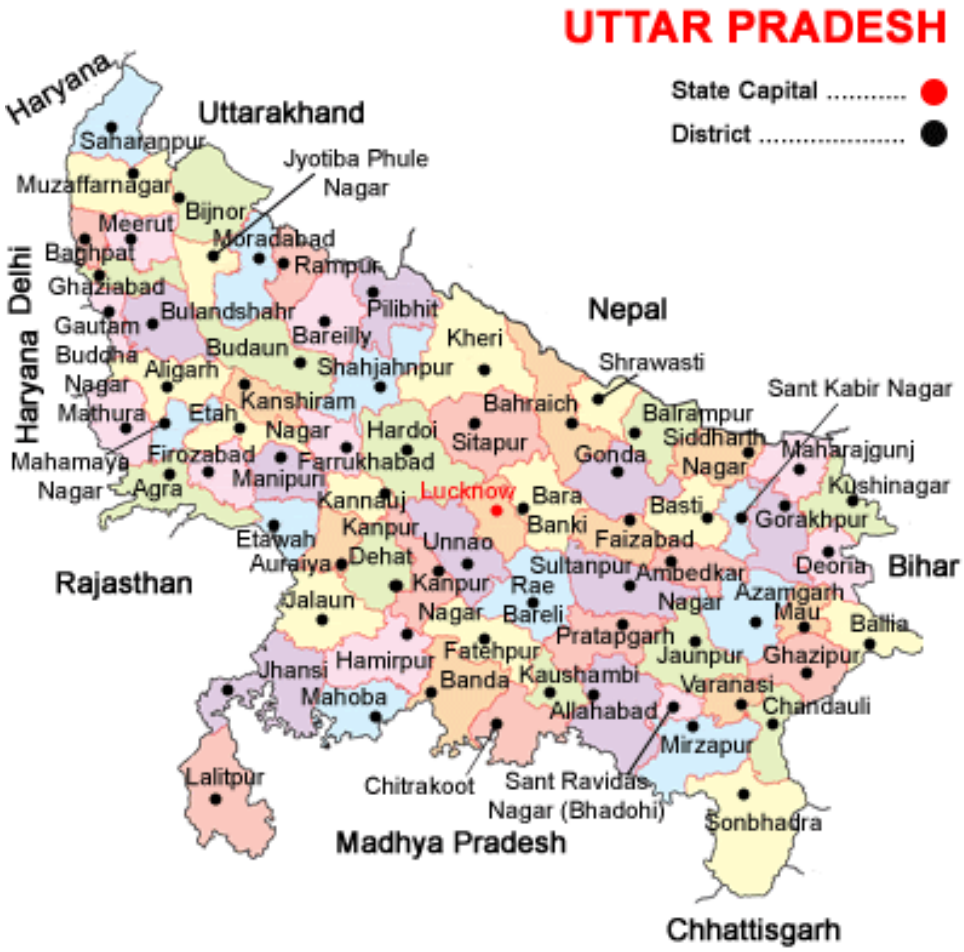
Livestock(year 2007)	Male(000)	Female(000)	Totat(000)
Non descriptive Cattle (local low yielding)	96.963	109.804	206.767
Improved cattle	0.011	0.012	0.023
Crossbred Cattle	0.056	0.243	0.299
Non descriptive Buffaloes (local low yielding)	14.353	54.943	69.296
Descript Buffaloes	14.007	53.577	67.584
Goat	71.615	113.653	185.268
Sheep			22.793
Other (Camel,Pig, Yak etc)			31.890
Commerical dairy farms (number)			0.000

1.12	**Sowing window for 5 major field crops**	**Bajra**	**Til**	**Rice**	**Urd**	**Jowar**	**Moong**	**Wheat**	**Barley**	**Gram/Pea**	**Mustard**
	Kharif –Rainfed	2nd week of July to last week of July	2nd week of July to last week of July	-	2nd week of July to First week of August	Last week of June to 2nd week of July	2nd week of July to First week of August	-	-	-	-
	Kharif - Irrigated	-	-	Last week of June 2nd week of August	-	-	-	-	-	-	-
	Rabi –Rainfed								Last week of Oct to last week of Nov	first week of Oct last week of Oct	2nd week of Sep to first week of Oct
	Rabi - Irrigated							first week of Nov last week of Nov	-	-	-

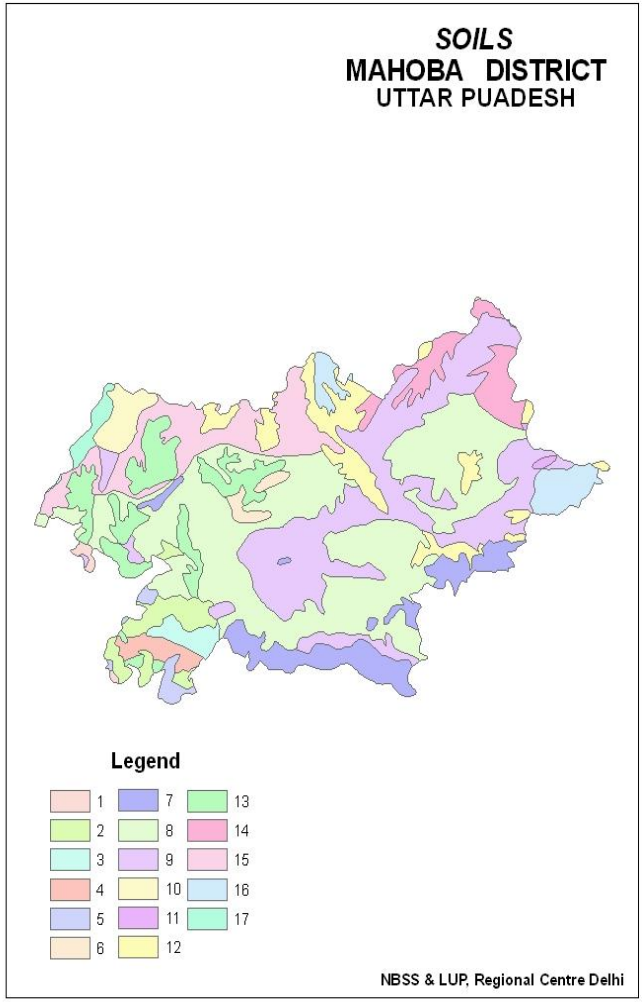
1.13	**What is the major contingency the district is prone to?**	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave		√	
	Cold wave		√	
	Frost		√	
	Sea water intrusion			√
	Sheath Blight, Stemborer , Pyrilla loose smut, Heliothis, Rust etc white grub.			√

Annexure I

Location map of Mahoba district



1.14. Soil map of Mahoba district



Granite/Gneissic landscape, Hills, Dome/Tors (10-15%slope)

1. Rock outcrops associated with shallow loamy skeletal soils, severely eroded and moderate stoniness

Undulating Upland/Plateau (3-5% slopes)

2. Moderately shallow, loamy soils severely eroded associated with deep, fine smectitc soils and moderately eroded
3. Deep, loamy-skeletal soils and moderately eroded and slight stoniness associated with moderately shallow loamy skeletal soils and severely eroded

Very gentle sloping uplands

4. Deep, fine, smectitic soils and moderately eroded associated with loamy soils and moderately eroded
5. Deep, fine, smectitic soils and slightly eroded associated with fine soils and moderately eroded

River valley (1-3% slope)

6. Deep, fine smectitic soils and slightly eroded associated with fine smectitic soils and moderately eroded

Alluvial plain,
Isolated Hillocks (15-30% slopes)

7. Rock outcrops; associated with shallow loamy-skeletal soils, severely eroded and moderately stoniness .

Undulating upland (3-5% slope)

8. Deep, loamy soils, moderately eroded associated with fine smectitic soils and slightly eroded

Very gently sloping uplands with hummocks (1-3%slope)

9. Deep, loamy soils, slightly eroded associated with fine, smectite soils slightly eroded.
10. Deep, fine smectitc soils, slightly eroded associated with loamy soils and slightly eroded
11. Deep, loamy soils, slightly eroded associated with silty soils, slightly eroded
12. Deep, fine soils, slightly eroded associated with fine smectitic soils and slightly eroded.
13. Deep, fine smectitic soils, slightly eroded
14. Deep, loamy soils, moderately eroded associated with fine smectitic soils and moderately eroded

Ravinous Land (5-10% slope)

15. Deep, loamy soils and severely eroded associated with loamy soils and moderately eroded
16. Deep, fine smectitic soils and are moderately eroded associated with fine soils moderately eroded.
17. Deep, loamy soils and moderately eroded

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation Normal onset of monsoon 20 June

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks (First week of July)	**Deep black soil (Mar and Kabar)**	Sorghum (Varsha,CSV 13,15 SPV 1616 Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) with ratio of 2:1 on raised bed	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Urd/ moong Sesame- T-78, Pragti, Sekhar	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Urd/ moong Sesame- T-78, Pragti, Sekhar	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks (3rd week of July)	**Deep black soil (Mar and Kabar)**	Sorghum (CSB 13 CSH 9 14, 16, 18)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) with ratio of 2:1 on raised bed	
		Sesame (Type 4, Type12,Type13, Sekhar, Pragati and Tarun)	No Change	Line sowing	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Black gram/ Green gram	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	
		Sesame (Type 4, Type 12, Sekhar, Pragati, Type 13, Tarun)	No Change	Line sowing with seed dril	
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Black gram/ Green gram	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks (1st week of August)	**Deep black soil (Mar and Kabar)**	Sorghum (CSB 13 CSH 9 14, 16, 18)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) with ratio of 2:1 on raised bed	
		Sesame (Type 4, Type12,Type13, Sekhar, Pragati and Tarun)	No Change	Line sowing	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Black gram/ Green gram	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	
		Sesame (Type 4, Type 12, Sekhar, Pragati, Type 13, Tarun)	No Change	Line sowing with seed drill	
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Black gram/ Green gram	No Change Prefer pigeon pea cultivars such as Narendra Arhar 1, Ajad, PDA 11	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (3rd week of August)	**Deep black soil (Mar and Kabar)**	Sorghum (CSB 13 CSH 9 14, 16, 18)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 1)	Fodder Sorghum (hybrid 5, MFSH3A) Pigeon pea(PDA 11, Narendra Arhar 1) /Urd (Pant U 35, Narendra Urd 1, Ajad urd 2, Sekhar 1, Sekhar 2 and Sekhar 3))	10%higher seed rate for fodder sorghum	
		Sesame (Type 4, Type12,Type13, Sekhar, Pragati and Tarun)	Fodder Sorghum (hybrid 5, MFSH3A) Pigeon pea(PDA 11, Narendra Arhar 1) /Urd (Pant U 35, Narendra Urd 1, Ajad urd 2, Sekhar 1, Sekhar 2 and Sekhar 3)		
	Parwa (Loamy Sand)	Sorghum+ pigeon pea Black gram/ Green gram	Fodder Sorghum (hybrid 5, MFSH3A) Pigeon pea(PDA 11, Narendra Arhar 1) /Urd (Pant U 35, Narendra Urd 1, Ajad urd 2, Sekhar 1, Sekhar 2 and Sekhar 3)		
		Sesame (Type 4, Type 12, Sekhar, Pragati, Type 13, Tarun)	Fodder Sorghum (hybrid 5, MFSH3A) Pigeon pea(PDA 11, Narendra Arhar 1) /Urd (Pant U 35, Narendra Urd 1, Ajad urd 2, Sekhar 1, Sekhar 2 and Sekhar 3)		
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Black gram/ Green gram	• Prefer pigeon pea cultivars such as Narendra Arhar 1, Ajad, PDA 11 • Fodder Sorghum		

			(hybrid 5, MFSH3A) Pigeon pea(PDA 11, Narendra Arhar 1) /Urd (Pant U 35, Narendra Urd 1, Ajad urd 2, Sekhar 1, Sekhar 2 and Sekhar 3)		

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.	**Deep black soil (Mar and Kabar)**	Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	• Weeding • Resowing of the crops under less than 30% plant population situation with sufficient soil moisture		
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Black gram/ Green gram	• Weeding Resowing of the crops under less than 30% plant population situation with sufficient soil moisture		
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Black gram/ Green gram	• Weeding Resowing of the crops under less than 30% plant population situation with sufficient soil moisture		

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	**Deep black soil (Mar and Kabar)**	Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	• Interculture •	Foliar spray with 1% KCl	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Urd/ moong	• Interculture •	Foliar spray with 1% KCl	
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Urd/ moong	• Interculture •	Foliar spray with 1% KCl	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	**Deep black soil (Mar and Kabar)**	Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)		Mulching with local available materials	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Urd/ moong		Mulching with local available materials	
	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Urd/ moong		Mulching with local available materials	
Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Deep black soil (Mar and Kabar)	Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)		**Harvest at maturity**	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Urd/ moong		**Harvest at maturity**	

	Rakar (Shallow sandy loam)	Sorghum+ pigeon pea+ Urd/ moong		**Harvest at maturity**	

2.1.2 Drought - Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	**Deep black soil (Mar and Kabar)**	Rice	No change	• Drum seeding under puddle field • Alternate wet and dry irrigation	Linked with UP Agro
		Wheat	Prefer varieties such as Raj 337, PBW 502, K0307, Halna	• Provide irrigation at critical stage as per availability of irrigation water • Ensure K application as RDF • Chemical Control of Phalaris minor	Seed available from SDC, NSC and SAU, kanpur
	Parwa (Loamy Sand)	Rice	No change	• Drum seeding under puddle field • Alternate wet and dry irrigation	
		Wheat	Prefer varieties such as Raj 337, PBW 502, K0307, Halna	• Provide irrigation at critical stage as per availability of irrigation water • Ensure K application as RDF • Chemical Control of weeds	

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	**Deep black soil (Mar and Kabar)**	Rice	No change	• Drum seeding under puddle field • Alternate wet and dry irrigation	
		Wheat	Prefer varieties such as Raj 337, PBW 502, K0307, Halna	• Provide irrigation at critical stage as per availability of irrigation water • Ensure K application as RDF Chemical Control of Phalaris minor	
	Parwa (Loamy Sand)	Rice	No change	• Drum seeding under puddle field Alternate wet and dry irrigation	
		Wheat	Prefer varieties such	• Provide irrigation at critical stage as	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			as Raj 337, PBW 502, K0307, Halna	per availability of irrigation water • Ensure K application as RDF • Chemical Control of weeds	

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	**Deep black soil (Mar and Kabar)**	Sorghum (CSB 13 CSH 9 14, 16, 18)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2)	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) with ratio of 2:1 on raised bed	
		Sesame (Type 4, Type12,Type13, Sekhar, Pragati and Tarun)	No Change	Line sowing	
	Parwa (Loamy Sand)	Sorghum+ pigeon pea+ Urd/ moong	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	
	Rakar (Shallow sandy loam)	Sesame (Type 4, Type 12, Sekhar, Pragati, Type 13, Tarun)	No Change	Line sowing with seed dril	
		Sorghum+ pigeon pea+ Urd/ moong	No Change	Intercropping of Sorghum (Varsha, CSV 13, SPB 1388, Bundella, CSH 16 and 13)+ Pigeon pea (Ajad , Pusa 9, PDA 11, Narendra Arhar 2) + Urd (Ajad 1 and Ajad 3, Narendra Urd 1) with ratio of 2:1:1 on raised bed	

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	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	**Deep black soil (Mar and Kabar)**	Pigeon pea	• No change • Prefer varieties such as UPAS 120	Raised bed planting	
		Sorghum	• No change		
		Wheat	Prefer varieties such as K8027, K9351, K9644, Lok 1	Foliar spray with 2% Urea +2% MOP Apply irrigation at CRI stage	
		Chick pea	Prefer varieties such as Radhe, Pusa 256, JG 16		
	Parwa (Loamy Sand)	Rice	Prefer Varieties such as Gobind, Pant 10 and Pant 12		
		Wheat	Prefer varieties such as K8027, K9351, K9644, Lok 1	Foliar spray with 2% Urea +2% MOP Apply irrigation at CRI stage	
	Rakar (Shallow sandy loam)	Sorghum	• No change		
		Black gram	•		
		Green gram	• Narendra moong 1, PDM 54, Pant moong 1, PDM 11		
		Wheat	• Prefer varieties such as K8027, K9351, K9644, Lok 1	Foliar spray with 2% Urea +2% MOP Apply irrigation at CRI	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				stage	
		Chick pea	• Prefer varieties such as Radhe, Pusa 256, JG 16		

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**
Outbreak of pests and diseases due to unseasonal rains	Not applicable			

2.3 Floods - NOT APPLICABLE

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

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

Extreme event type	Suggested contingency measure[r]			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Horticulture				
Kinnow	Use agronet 50% or thatching with local material	• Provide mulching with 100micron plastic or with local available materials • Spray of water • Frequent irrigation	Provide mulching with 100 micron plastic or locally available materials Spray of micronutrients Plant protection measures	

Guava	Use agronet 50% or thatching with local material			
Custard apple	Use agronet 50% or thatching with local material			
Aonla	Use agronet 50% or thatching with local material			
Cold wave[q]				
Wheat	Spray 2% urea and 2% MOP Apply light irrigation		Apply light irrigation	
Mustard				
Chickpea				
Lentil				
Horticulture				
Kinnow	Apply Light irrigation			
Guava				
Custard apple				
Aonla				
Horticulture				
Kinnow	In case of low intensity take up appropriate plant protection measures			
Guava				
Custard apple				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

		Suggested contingency measures	
	Before the event	**During the event**	**After the event**
Drought			
Feed and Fodder availability	Top dressing of N in 2-3 split doses @ 20-25 kg N/ha in common property resources (CPRs) or private property resources (PPRs) like waste and degraded lands with the monsoon pattern for higher biomass production Promote cultivation of short duration fodder crops of sorghum/bajra/maize suitable to the district Sowing of fodder crops like *Stylo* and *Cenchrus* on bunds so as to provide fodder and strengthening of bunds Avoid burning of wheat and paddy straw and storing as dry fodder for future use Proper drying, bailing and densification of harvested dry fodder for transport to the needy villages Complete feed preparation using red gram stalks may be exploited Preserving maize fodder as silage for future use Establishment of silvi-pastoral system in CPRs with *Stylosanthus hamata* and *Cenchrus ciliaris* as grass with *Leucaena leucocephala*	Harvest and use biomass of dried up crops (Sorghum, Bajra, Maize, Rice, Wheat, pea, chick pea etc) material as fodder. Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS). Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals In case of mild drought, the available dry fodder may be enriched with urea and molasses and the productive livestock should be supplemented with vitamin & minerals mixture. The available silage may be used as green fodder supplement for high yielders and pregnant animals In case of severe drought, UMMB, hay, concentrates and vitamin & mineral mixture should be transported to the needy areas from the reserves at the district level initially and latter stages from the near by districts. All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS Herd should be split and supplementation should be given only to the highly productive and breeding	Green and concentrates supplementation should be provided to all the animals. Short duration fodder crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible Promote cultivation of fodder crops during Rabi season

	as tree component Creation of permanent fodder, feed and fodder seed banks in all drought prone villages	animals Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock) Available kitchen waste should be mixed with dry fodder while feeding Arrangements should be made for mobilization of small ruminants across the districts where no drought exits with subsidized road/rail transportation and temporary shelter provision for the shepherds Unproductive livestock should to be culled during severe drought Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals) in case of severe drought Subsidized loans (5-10 crores) should be provided to the livestock keepers for purchase of supplements, concentrate feed ingredients etc., in case of severe drought	
Cyclone & Floods	**NA**		
Heat & Cold wave	In villages which are chronically prone to heat waves the following permanent measures are suggested i) Plantation of trees like Neem, Pipal, Subabul around the shed ii) Spreading of husk/straw/coconut leaves on the roof of the shed iii) Water sprinklers / foggers in the animal shed **iv)** Application of white reflector paint on the roof to reduce thermal	Allow the animals preferably early in the morning or late in the evening for grazing during heat waves Allow for grazing between 10AM to 3PM during cold waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Add 25-50 ml of edible oil in concentrates per kg and fed to the animal during cold waves Apply / sprinkle lime powder (5-10g per square feet) in	Green and concentrates supplementation should be provided to all the animals. Allow the animals for grazing (normal timings)

	radiation effect **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 closing during night	the animal shed during cold waves to neutralize ammonia accumulation Put on the foggers / sprinklers during heat weaves and heaters during cold waves in case of high productive animals In severe cases, vitamin 'C' (5-10ml per litre) and electrolytes (Electral powder @ 20g per litre) should be added in water during severe heat waves.	
Health and Disease management	List out the endemic diseases (species wise) in that district and store vaccines for those diseases Timely vaccination (as per enclosed vaccination schedule) against all endemic diseases Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district	Constitution of Rapid Action Veterinary Force Procurement of emergency medicines and medical kits Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Rescue of sick and injured animals and their treatment	Conducting mass animal health camps Conducting fertility camps Mass deworming camps
Insurance	Insurance policy for loss of production due to drought may be developed Encouraging insurance of livestock	Listing out the details of the dead animals and loss of production in high yielders	Submission for insurance claim and availing insurance benefit Purchase of new productive animals
Drinking water	Identification of water resources Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)	Restrict wallowing of animals in water bodies/resources Provision of wholesome clean drinking water at least 3 times in a day	Bleach (0.1%) drinking water / water sources Provide clean drinking water

2.5.2 Poultry

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice, bajra etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds
Drinking water	Rain water harvesting	Sanitation of drinking water	Give sufficient water as per the bird's requirement
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and fowl pox	Mixing 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
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 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 of house hold grain Provide cool and clean drinking water with electrolytes and vit. C (5-10 ml per litre) In hot summer, add anti-stress probiotics in drinking water or feed (Reestobal etc., 10-20ml per litre)	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 Don't allow for scavenging during early morning and late evening	Routine practices are followed
Health and disease management	Arrangement for protection from chilled air	Supplementation of grains Antibiotics (Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to protect birds from pneumonia	Routine practices are followed