

State: Uttar Pradesh
Agriculture Contingency Plan for District: Etah

1.0 District Agriculture profile				
1.1	Agro-Climatic/ Ecological Zone			
	Agro-Ecological Sub Region(ICAR)		Western plain zone	
	Agro-Climatic Zone (Planning Commission)		Upper Gangetic Plain Region	
	Agro-Climatic Zone (NARP)		UP-3 South-western Semi-arid Zone	
	List all the districts falling the NARP Zone* (^ 50% area falling in the zone)		Firozabad, Alighrah, Hathras, Mathura, Mainpuri, Etah	
	Geographical coordinates of district headquarters		Latitude	Latitude
			27.35N	78.40E
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS		-	
	Mention the KVK located in the district with address		Krishi Vigyan Kendra Etah	
Name and address of the nearest Agromet Field Unit(AMFU,IMD)for agro advisories in the Zone		SVBP University of Agriculture & Technology Meerut		

1.2	Rainfall	Normal RF (mm)	Normal Rainy Days (Number)	Normal Onset	Normal Cessation
	SW monsoon (June-sep)	612.1	49	3rd week of June	4th week of September
	Post monsoon (Oct-Dec)	29.4	10		
	Winter (Jan-March)	39.8	5	-	-
	Pre monsoon (Apr-May)	13.6	2	-	-
	Annual	694.9	66		

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)	244.1	218.9	1.0	21.9	0.2	10.5	0.5	2.9	6.9	5.2

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Deep, loamy soils	98.5	45%
	Deep Silty loam	52.5	24 %
	Deep fine soil	39.0	18 %
	4.Saline-alkaline	21.0	10 %

1.5	Agricultural land use	Area('000 ha)	Cropping intensity (%)
	Net sown area	185.2	138
	Area sown more than once	117.1	
	Gross cropped area	302.3	

1.6	Irrigation	Area('000 ha)		
	Net irrigation area	181.6		
	Gross irrigated area	274.7		
	Rain fed area	3.7		
	Sources of irrigation (Gross Irr. Area)	Number	Area('000 ha)	Percentage of total irrigated area
	Canals		33.9	12.3
	Tanks		0	
	Open wells		0	
	Bore wells (Tube wells)		240.8	87.7
	Lift irrigation schemes		NA	
	Micro-irrigation		NA	
	Other sources		0	
	Total Irrigated Area		274.7	
	No. of Pump sets (2011-12)		68954	
	No. of Tractors		8345	
Groundwater availability and use* (Data source: State/ Central Ground water Department/ Board)	No of blocks- Tehsils-	(%)area	Quality of water	
Over exploited	1			
Critical	0			
Semi-critical	3			
Safe	0			
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)

1.7	Major field crops cultivated	Area('000 ha)							
		Kharif			Rabi			Summer	Total
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
Wheat	0	0	0	135.228	0	135.228	0	135.228	
Pearl millet	24.190	21.831	46.021	-	-	-	-	46.021	
Maize	22.508	2.690	25.198	-	-	-	-	25.198	
Rice	17.788	0.721	18.509	0	0	0	0	18.509	
Rapeseed Mustard	-	-	-	10.834	0	10.834	0	10.834	
Barley	-	-	-	8.879	0	8.879	-	8.879	
Sorghum	Not available								
Urd	Not available								

	Horticulture crops -Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	0.128	0.128	-
	Guava	0.164	0.164	-
	Horticulture crops -Vegetables			
	Potato	10.168	10.168	-
	Onion	0.373	0.373	-
	Pea	6.933	6.933	-
	Medicinal and Aromatic crops			
	Mentha	0.154	0.154	-

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

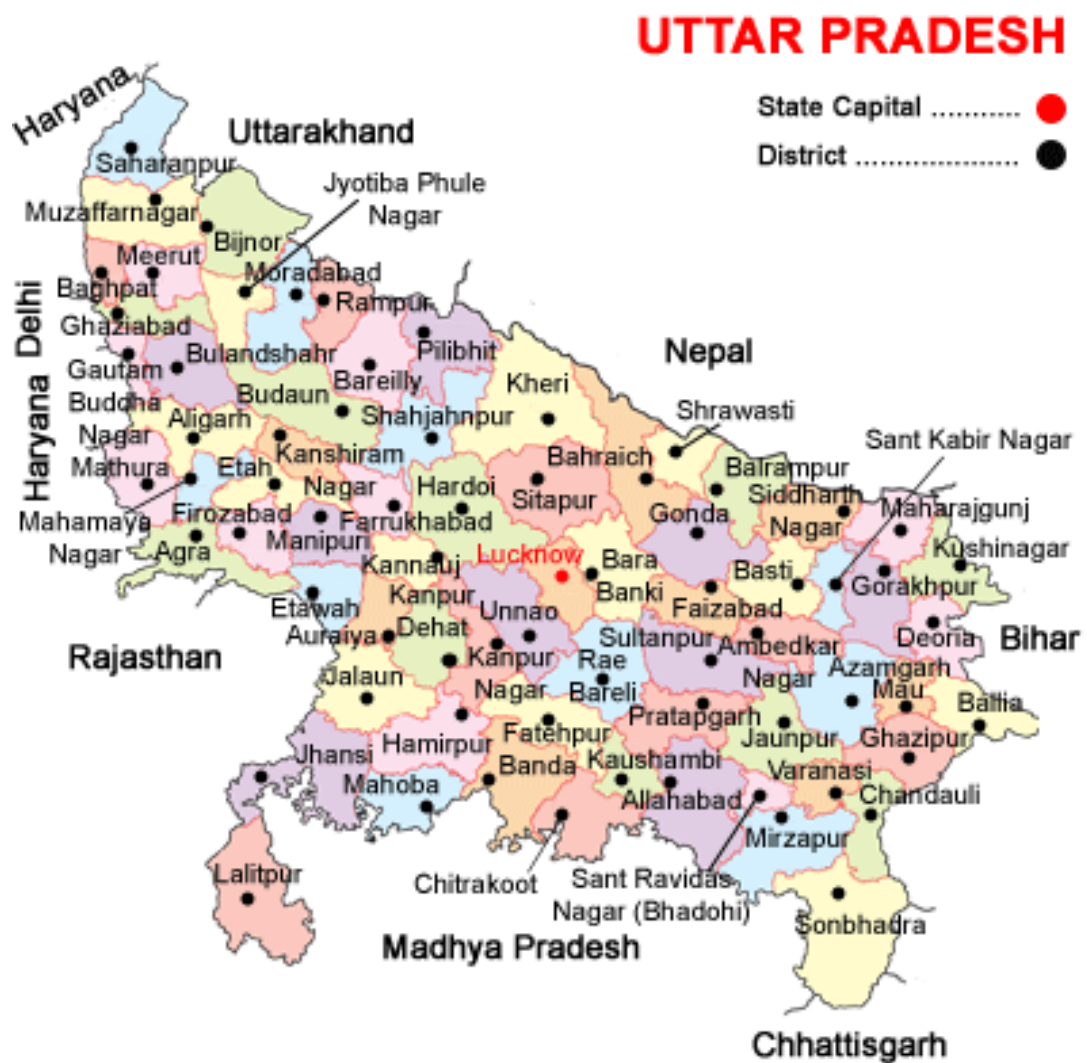
1.8	Major field crops cultivated	Area('000 ha)								Crop residue as fodder ('000 tons)
		Kharif		Rabi		Summer		Total		
		Production ('000 t)	Productivity (Kg/ha)	Production ('000t)	Productivity (Kg/ha)	Production ('000 t)	Productivity (Kg/ha)	Production ('000t)	Productivity (Kg/ha)	
	Rice	53.596	2271	-	-	-	-	53.596	2271	NA
	Wheat	-	-	479.842	3118	-	-	479.842	3118	NA
	Maize	64.053	2083	-	-	-	-	64.053	2083	NA
	Pearl millet	101.393	2051	-	-	-	-	101.393	2051	NA
	Barley	-	-	28.921	3275	-	-	28.921	3275	NA
	Rapeseed Mustard	-	-	19.284	1549	-	-	19.284	15.49	NA

1.9	Livestock(year 2007)	Male(000)	Female(000)	Total (000)
	Non descriptive Cattle (local low yielding)	94.313	112.383	206.696
	Improved cattle	0.014	0.054	0.068
	Crossbred Cattle	5.249	11.696	16.945
	Non descriptive Buffaloes (local low yielding)	84.761	353.877	438.638
	Descript Buffaloes	98.657	437.910	536.567
	Goat	188.293	322.120	510.413
	Sheep			8.258
	Other (Camel,Pig, Yak etc)			31.411
	Commerical dairy farms (number)			0.000

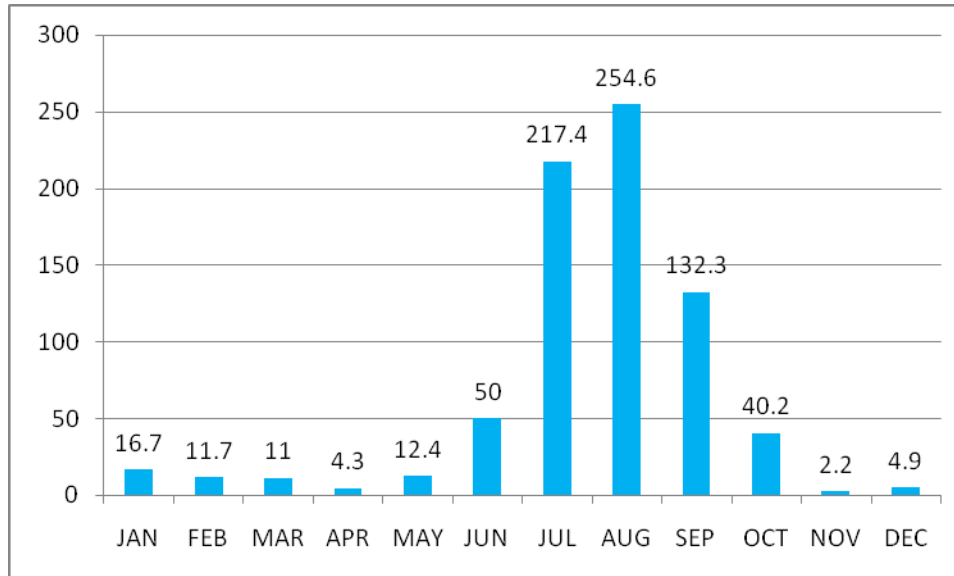
1.10	Sowing window for 5 major field crops	Pearl millet	Maize	Rice	Urd	Sorghum	Pigeon Pea	Wheat	Pea	Gram	Mustard
	Kharif – Rainfed	2 nd week of July to last week of July	3rd week of June to First week of July	-	2 nd week of July to First week of August	First week of July to 2 nd week of July	First week of July to Last week of July	-	-	-	-
	Kharif - Irrigated	-	-	3rd week of June to Last week of July	2 nd week of July to First week of August	First week of July to 2 nd week of July	-	-	-	-	-
	Rabi –Rain fed							Last week of Oct to 2nd week of Nov	First week of Oct to last week of Oct	First week of Oct to last week of Oct	First week of Sep to 2nd week of Oct
	Rabi - Irrigated							2nd week of Nov to last week of Dec	-	-	-

1.11	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 loos smut, Heliothis, Rust etc white grub.	-	✓	

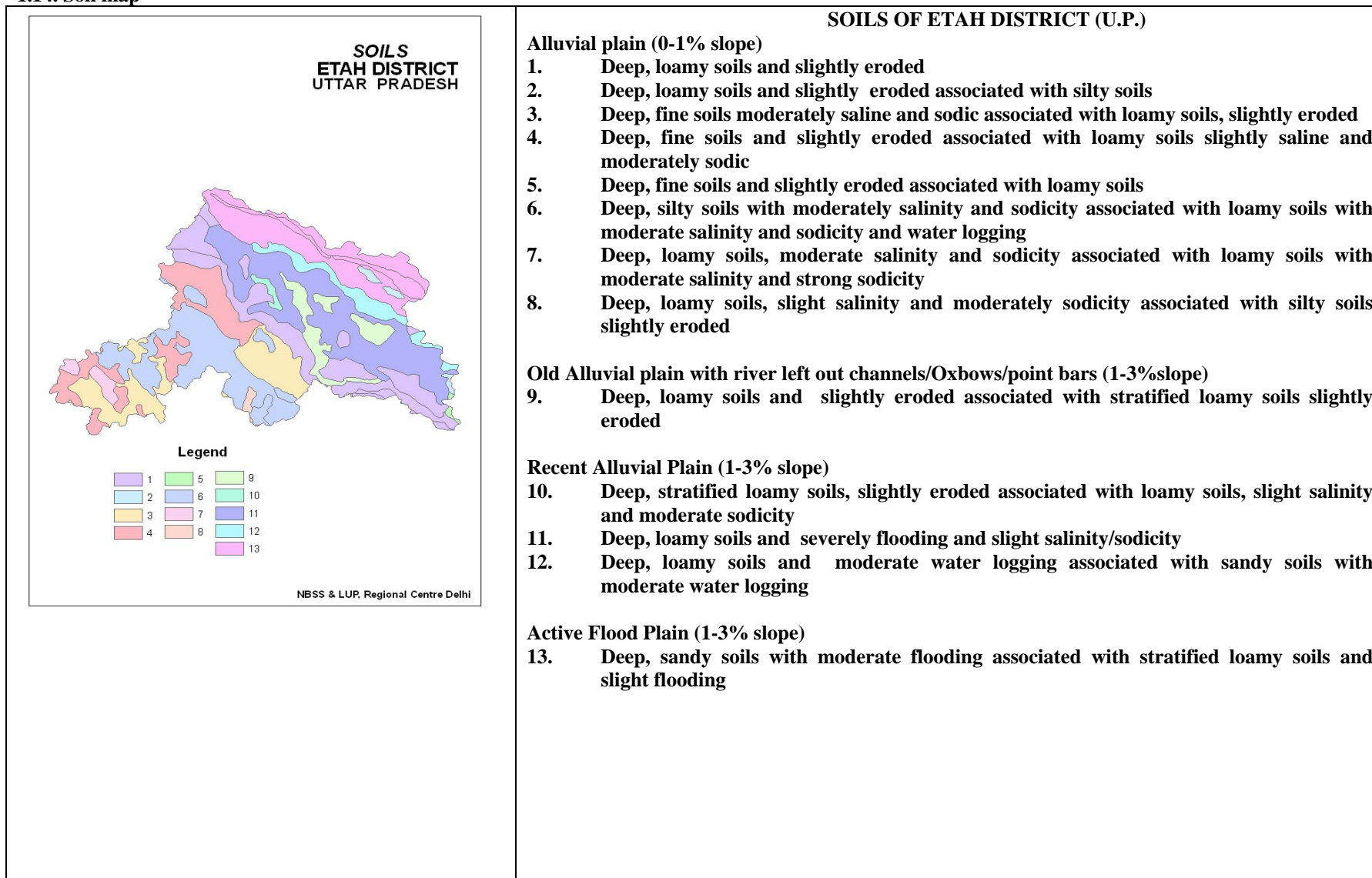
Annexure I
Location map of Etah district



Annexure 2
Average Month-wise rainfall (mm) in Etah District



1.14. Soil map



Source: NBSSLUP, Regional Centre, New Delhi

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rain fed situation

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop	Change in crop / cropping system ^c including variety	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (1 st week of July)	Deep, loamy soils	Sorghum: Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	No change	Prefer medium maturing varieties, Thinning, Interculture,	Prefer disease free certified seed from a reliable source Like SDC/ SAUs
		Pearl millet,- Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	No change	Prefer medium maturing varieties, Thinning, Interculture,	
		Pigeon Pea Narendra arhar-1, Narendra arhar-2, Azad,	No Change	Ridge Planting Thinning, Inter-culture,	
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	No change	Manual weeding, Line sowing	
		Maize: Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	No change	Prefer medium maturing varieties, Thinning, <i>Inter-culture</i> , Mulching	Linked with SDC/ SAUs
Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 4 weeks (July 3 rd week)	Deep, loamy soils	Sorghum: Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta	No change	Adopt 10-15% more seed Prefer medium maturing varieties, <i>Inter-culture</i> ,	Prefer disease free certified seed from a reliable source

		Hybrid- CSH-9, 16,14,18,13 and CSH-23		Spray of 2% MOP	Like SDC/ SAUs
		Pearl millet,- Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	No change	Adopt 10-15% more seed Prefer medium maturing varieties, <i>Inter-culture</i> , Spray of 2% MOP	
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	No change	Adopt 10-15% more seed Prefer medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	No change	Use 10-15% more seed Use medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	
		Maize: Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Replace wit Pearl millet or Sorghum or Urd	Use 10-15% more seed Use medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation ^a	Normal Crop	Change in crop/cropping system ^c	Agronomic measures ^d	Remarks on Implementation ^e
Delay by 6 weeks (Aug. 1 st week)	Deep, loamy soils	Sorghum: Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	Replace with Pearl millet or Urd	Use 10-15% more seed Use medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	Linked with SDC/ SAUs
		Pearl millet: Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	No change	Use 10-15% more seed Use medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	Linked with SDC/ SAUs
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	Replace with Pearl millet or Urd	Use 10-15% more seed Use medium maturing varieties, <i>Inter-</i>	Linked with SDC/ SAUs

				<i>culture</i> , Mulching Spray of 2% MOP	
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	No change	Use 10-15% more seed Use medium maturing varieties, <i>Inter-culture</i> , Mulching Spray of 2% MOP	Linked with SDC/ SAUs
Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation^a	Normal Crop/cropping system^b	Change in crop/cropping system^c	Agronomic measures^d	Remarks on Implementation^e
Delay by 8 weeks (Aug. 3rd week)	Deep, loamy soils	Pearl millet: Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	Keep fallow and conserve moisture	Moisture conservation and preparation for rabi sowing	-
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	Keep fallow and conserve moisture	Moisture conservation and preparation for rabi sowing	-

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major Farming situation^a	Normal Crop/cropping system^b	Crop management^c	Soil nutrient & moisture conservation measues^d	Remarks on Implementation^e
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Deep loamy soils	Sorghum: Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	Life saving irrigation Re sowing if plant population less than 70%	, Manual weeding	
		Pearl millet: Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	Life saving irrigation Re sowing if plant population less than 70%	Manual weeding	
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	Life saving irrigation Re sowing if plant population less than 70%	Mulching , Manual weeding	
		Urd- Uttara, Azad-2, Azad-3, Pant-	Life saving irrigation Re sowing if plant population	Manual weeding	

		U-35, Pant U-40	less than 70%		
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Life saving irrigation Re sowing if plant population less than 70%	Mulching , Manual weeding	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^a	Normal Crop/cropping system ^b	Crop management ^c	Soil nutrient & moisture conservation measures ^d	Remarks on Implementation ^e
At vegetative stage	Deep loamy soils	Sorghum : Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	Life saving irrigation if available	Spray of 2% MOP.	
		Pearl mille Composite- ICMB-155, WCC-75,ICTP-8203 and Raj- 171 Hybrid- Pusa-23 & 322 and ICMH-451	Life saving irrigation if available	Spray of 2% MOP.	
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	Life saving irrigation if available	Spray of 2% MOP.	
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	Life saving irrigation if available	Spray of 2% MOP.	

		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Life saving irrigation if available	Spray of 2%MOP.	
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Condition	Major Farming situation ^a	Normal Crop	Suggested Contingency measures		
			Crop management ^c	Soil nutrient & moisture conservation measues ^d	Remarks on Implementation ^e
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Deep loamy soils	Sorghum Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	Life saving irrigation, if available	Spray 2% solution of Urea and 2%MOP.	
		Pearl millet,- Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	Life saving irrigation	Spray 2% solution of Urea and 2%MOP.	
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	Life saving irrigation	Spray 2%MOP. Mulching	
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	Life saving irrigation	Spray 2%MOP. Mulching	
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Life saving irrigation	Spray 2% solution of Urea and 2%MOP. Mulching	

Condition	Major Farming situation ^a	Normal Crop	Suggested Contingency measures		
			Crop management ^c	Rabi Crop planning ^d	Remarks on Implementation ^e
Terminal drought (Early withdrawal of monsoon)	Deep loamy soils	Sorghum Composite- Varsha, CSV-13, CSV-15,SPB-1388 and Vijeta Hybrid- CSH-9, 16,14,18,13 and CSH-23	In case of severe drought, harvest for fodder	Prepare Field for rabi sowing	
		Pearl millet,- Composite- ICMB-155, WCC-75,ICTP-8203 and Raj-171 Hybrid- Pusa-23 & 322 and ICMH-451	In case of severe drought, harvest for fodder	Prepare Field for rabi sowing	
		Pigeon Pea – Narendra arhar-1, Narendra arhar-2, Azad,	Life saving irrigation Spray 2%MOP		
		Urd- Uttara, Azad-2, Azad-3, Pant-U-35, Pant U-40	If crop not reviving use the crop as fodder. If 75% mature than harvest.	Prepare Field for rabi sowing	

2.1.2 Drought - Irrigated situation

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Delayed release of water in canals due to low rainfall	Deep loamy soils	Paddy: (Transplanted) Govind, Narendra-118,97 , Ashwani, (Early) Saket-4, Ratna, Pant-12, Narendra-80, 2026 (Medium) Sarjoo-52, Pant-4, Narendra-359, 2026,2064	No change	Direct seeded/ Drum seeded Paddy Prefer early maturing varieties ie. Saket-4, Ratna, Pant-12, Narendra-80, 2026 NDR-118 Transplant 3-4 seed lings / hil Wet and dry irrigation, weed management	Linked with SDC/SAU's
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510	No change	Irrigate at critical stage Ridge planting	Linked with SDC/SAU's

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
			Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459		

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Limited release of water in canals due to low rainfall	Deep loamy soils	Rice: (Transplanted) Govind, Narendra-118,97 , Ashwani, (Early) Saket-4, Ratna, Pant-12, Narendra-80, 2026 (Medium) Sarjoo-52, Pant-4, Narendra-359, 2026,2064	No change	<ul style="list-style-type: none"> • Direct seeded/ Drum seeded Paddy/ SRI • Use early maturing varieties ie. Saket-4, Ratna, Pant-12, Narendra-80, 2026 NDR-118 • Transplant 3-4 seed lings / hill • Wet and dry irrigation, weed management • Ensure application of MOP 	Prefer disease free certified seed from a reliable source
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	No change	<ul style="list-style-type: none"> • Prefer short duration varieties • Irrigation at Critical stage • Ridge planting • Weed management • Ensure application of MOP 	

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Non release of water in canals under delayed onset of monsoon in catchment	Deep loamy soils	Rice: (Transplanted) Govind, Narendra-118,97 , Ashwani, (Early) Saket-4, Ratna, Pant-12, Narendra-80, 2026 (Medium) Sarjoo-52, Pant-4, Narendra-359, 2026,2064	Replace with Sorghum / Pearl millets/Pigeon Pea/Til	Light irrigation at critical stages Ridge planting/line sowing, 10-15% increase seed Weed management	Prefer disease free certified seed from a reliable source
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Replace by Jowar/ Pearl millets/Pigeon Pea/Til	Light irrigation at critical stages Ridge planting/line sowing, 10-15% increase seed Weed management	

Condition	Major Farming situation ^f	Normal Crop/cropping system ^g	Suggested Contingency measures		
			Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Lack of inflows into tanks due to insufficient /delayed onset of monsoon			Not applicable		

Condition	Suggested Contingency measures				
	Major Farming situation ^f	Normal Crop/cropping system ^g	Change in crop/cropping system ^h	Agronomic measures ⁱ	Remarks on Implementation ^j
Insufficient groundwater recharge due to low rainfall	Deep loamy soils	Rice: (Transplanted) Govind, Narendra-118,97 , Ashwani, (Early) Saket-4, Ratna, Pant-12, Narendra-80, 2026 (Medium) Sarjoo-52, Pant-4, Narendra-359, 2026,2064	Replace with Sorghum / Pearl millets/Pigeon Pea/Til	<ul style="list-style-type: none"> • Light irrigation at critical stage, • Ridge planting/line sowing, • 10-15% increase seed • Weed management 	Linked with SDC/SAU's
		Maize Composite- Naveen, Azad uttam, Pragati,Gaurav and KH-510 Hybrid- Ganga-11, HQPM-5 and Prakash, JH-3459	Replace by Jowar/ Pearl millets/Pigeon Pea/Til	<ul style="list-style-type: none"> • Light irrigation at critical stage, • Ridge planting/line sowing, • 10-15% increase seed • Weed management 	Linked with SDC/SAU's

2.2 Unusual rains (untimely, un seasonal etc) (for both Rain fed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage ^k	Flowering stage ^l	Crop maturity stage ^m	Post harvest ⁿ
Continuous high rainfall in a short span leading to water logging				
Paddy	Bunding around the field	Bunding around the field	Drain out excess water	Shift the produce to safer place
Maize	Drain out excess water from the fields			
Sorghum				
Pearl millet				
Pigeon pea				
Urdbean				
Heavy rainfall with high	Not applicable			

speed winds in a short span²				
Outbreak of pests and diseases due to unseasonal rains				
Paddy	Spray of Chloropyriphos 2.5 lt./ hac for termite and For stemborer (Cartap @25 kg/ hac)	Dusting of Methyl parathion @15 kg/hac for Gandhi Bug and Chlorothalonil @2ml/lit of water for false smut.	-	
Maize	Spray of Chloropyriphos 2.5 lt./ hac for termite and For stemborer (Cartap @25 kg/ hac)	Spray of Validamycin @2.7 ml/lit. of water solution for banded leaf and sheath blight.	-	-
Sorghum	Spray of Chloropyriphos 2.5 lt./ hac for termite and For stemborer (Cartap @25 kg/ hac)	Spray of Carbandazim (0.05%)+ dithane M 45 (0.2%) for early and late leaf spots and rust.	-	-
Pearl millet	Spray of Chloropyriphos @3.50 lt./ hac for early shoot borar	Spray of Mancozeb(0.2%) for rust.		
Pigeon pea	Spray of Chloropyriphos 2.5 lt./ hac for termite	Spray of Chloropyriphos 2.5 lt./ hac Or Monocrtophos @1.25lt/hac for control podborar	-	-
Urdbean	Spray of Chloropyriphos 2.5 lt./ hac for termite	Spray of Dimethoate 1.00 lt./ hac Or imidachlorpide @250 ml/hac for control of thrips/	-	-

2.3 Floods : Not applicable

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

Extreme event type	Suggested contingency measure ^r			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Paddy	Drain out the ponded water if any and irrigate with fresh water	-	-	-
Horticulture				
Mango	Frequent irrigation	Frequent irrigation	Frequent irrigation	-
Guava	Frequent irrigation	Frequent	Frequent irrigation	

		irrigation		
Cold wave				
Potato	-	Frequent irrigation & Preventive spraying of fungicide		
Horticulture				
Mango	-	Frequent irrigation		
Guava	-	Frequent irrigation		
Frost				
Potato	-	Frequent irrigation & Preventive spraying of fungicide		

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	<p>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</p> <p>Promote cultivation of short duration fodder crops of sorghum/bajra/maize suitable to the district</p> <p>Sowing of fodder crops like <i>Stylo</i> and <i>Cenchrus</i> on bunds so as to provide fodder and strengthening of bunds</p> <p>Avoid burning of wheat and paddy straw and storing as dry fodder for future use</p> <p>Proper drying, bailing and densification of harvested dry fodder for transport to the needy villages</p> <p>Complete feed preparation using red gram stalks may be exploited</p> <p>Preserving maize fodder as silage for future use</p>	<p>Harvest and use biomass of dried up crops (Sorghum, Bajra, Maize, Rice, etc) material as fodder.</p> <p>Harvest the tree fodder (Neem, Subabul, Acasia, Pipal etc) and unconventional feeds resources available and use as fodder for livestock (LS).</p> <p>Available feed and fodder should be cut from CPRs and stall fed in order to reduce the energy requirements of the animals</p> <p>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.</p> <p>The available silage may be used as green fodder supplement for high yielders and pregnant animals</p> <p>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</p> <p>Herd should be split and supplementation should be given only to the highly productive and breeding animals</p> <p>Provision of emergency grazing/feeding (Cow-calf camps or other special arrangements to protect high productive & breeding stock)</p> <p>Available kitchen waste should be mixed with dry fodder while feeding</p>	<p>Green and concentrates supplementation should be provided to all the animals.</p> <p>Short duration fodder crops of should be sown in unsown and crop failed areas where no further routine crop sowing is not possible</p> <p>Promote cultivation of fodder crops during Rabi season</p>

	<p>Establishment of silvi-pastoral system in CPRs with <i>Stylosanthus hamata</i> and <i>Cenchrus ciliaris</i> as grass with <i>Leucaena leucocephala</i> as tree component</p> <p>Creation of permanent fodder, feed and fodder seed banks in all drought prone villages</p>	<p>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</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) in case of severe drought</p> <p>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</p>	
Heat & Cold wave	<p>In villages which are chronically prone to heat waves the following permanent measures are suggested</p> <ol style="list-style-type: none"> 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 radiation effect <p>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</p>	<p>Allow the animals preferably early in the morning or late in the evening for grazing during heat waves</p> <p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Add 25-50 ml of edible oil in concentrates per kg and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder (5-10g per square feet) in the animal shed during cold waves to neutralize ammonia accumulation</p> <p>Put on the foggers / sprinklers during heat waves and heaters during cold waves in case of high productive animals</p> <p>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.</p>	<p>Green and concentrates supplementation should be provided to all the animals.</p> <p>Allow the animals for grazing (normal timings)</p>
Health and	List out the endemic diseases (species wise) in that district and	Constitution of Rapid Action Veterinary Force	Conducting mass animal health camps

Disease management	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	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 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	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	Supplementation to all survived birds

		Culling of weak 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