

**State: Uttar Pradesh**  
**Agriculture Contingency Plan for District: Balrampur**

<b>1.0 District Agriculture profile</b>				
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>			
	Agro Ecological Sub Region (ICAR)	Eastern Plain, Hot Subhumid (moist) Eco-sub region (13.2)		
	Agro-Climatic Zone (Planning Commission)	Middle Gangetic Plain Region (IV)		
	Agro Climatic Zone (NARP)	North Eastern Plain Zone (UP-8)		
	List all the districts falling under the NARP Zone*(*>50% area falling in the zone)	Barabanki,Ambedkarnagar,Faizabad,Sultanpur,Azamgarh,Mau,Jaunpur,Varanasi, Gazipur, Ballia, Bhadohi		
	Geographic coordinates of district headquarters	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude</b>
		26°75' N	82°07' E	91.5 -106 m
	Name and address of the concerned ZRS/ZARS/ RARS/ RRS/ RRTTS	Directorate of Research, SAU, Kumarganj, Faizabad		
Mention the KVK located in the district with address	KVK, Balrampur			

<b>1.2</b>	<b>Rainfall</b>	<b>Normal RF(mm)</b>	<b>Normal Rainy days (number)</b>	<b>Normal Onset</b>	<b>Normal Cessation</b>
	SW monsoon (June-Sep)	1076.8	42	3 <sup>rd</sup> week of June	1 <sup>st</sup> week of October
	NE Monsoon(Oct-Dec)	81.4	7	-	-
	Winter (Jan- Feb)	60	4	-	-
	Summer (March-May)	34.9	6	-	-
	Annual	1253.1	59	-	-

<b>1.3</b>	<b>Land use pattern of the district</b>	<b>Geographical Area</b>	<b>Cultivable area</b>	<b>Forest area</b>	<b>Land under non-agricultural use</b>	<b>Permanent pastures</b>	<b>Cultivable wasteland</b>	<b>Land under Misc. tree crops and groves</b>	<b>Barren and uncultivable land (acres)</b>	<b>Current fallows</b>	<b>Other fallows</b>
	<b>Area ('000 ha)</b>	324.69	212.6	58.9	33.3	0.23	2.015	5.36	3.51	5.96	2.7

<b>1.4</b>	<b>Major Soils</b>	<b>Area ('000 ha)</b>	<b>Percent (%) of total Geographical area</b>
	Sandy loam soils	-	-
	Loam soils	-	-
	Clay loam soils	-	-

<b>1.5</b>	<b>Agricultural land use</b>	<b>Area ('000 ha)</b>	<b>Cropping intensity (%)</b>
	Net sown area	212.6	172.41
	Area sown more than once	152.1	
	Gross cropped area	364.2	

<b>1.6</b>	<b>Irrigation</b>	<b>Area ('000 ha)</b>		
	Net irrigated area	252.204		
	Gross irrigated area	368.329		
	Rainfed area			
	<b>Sources of Irrigation</b>	<b>Number</b>	<b>Area ('000 ha)</b>	<b>Percentage of total irrigated area</b>
	Canals		64.01	19.28
	Tanks		0.004	
	Open wells		0.133	
	Bore wells	17.54	174.05	47.25
	Lift irrigation schemes			
	Micro-irrigation			

	Other sources (please specify)			
	Total Irrigated Area		368.329	
	Pump sets		135	36.6
	No. of Tractors			
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited			
	Critical			
	Semi- critical			
	Safe			
	Wastewater availability and use			
	Ground water quality			
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

### 1.7 Area under major field crops & horticulture (as per latest figures of 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
	Rice	100.6	0.3	100.9	-	-	-	-	100.9
	Sorghum	0.1	-	0.1	-	-	-	-	0.1
	Maize	5.6	0.4	6.0	-	-	-	-	6.0
	Pigeonpea	5.4	-	5.4	-	-	-	-	5.4
	Wheat	-	-	-	83.1	0.06	83.2	-	83.2
	Chickpea	-	-	-	4.9	-	4.9	-	4.9
	Lentil	-	-	-	26.0	0.003	26.0	-	26.0

	Horticulture crops - Fruits	Area ('000 ha)		
		-	-	-

<b>Horticulture crops - Vegetables</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
Potato	2.6	2.6	
Onion	0.1	0.1	
Others	6.8	6.6	0.224

<b>Medicinal and Aromatic crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
<b>Plantation crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
<b>Fodder crops</b>	<b>Total</b>	<b>Irrigated</b>	<b>Rainfed</b>
Sorghum	0.11		
Bajra	1.06		
Maize	557.3		
<b>Total fodder crop area</b>	3.6	1.2	2.4
<b>Grazing land</b>			
<b>Sericulture etc</b>			

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>
	Indigenous			306.29
	Non descriptive Cattle (local low yielding)			
	Improved crossbred cattle (Cow & Buffalo only)			214.08
	Non descriptive Buffaloes (local low yielding)			
	Buffaloes			
	Goat		-	136.0
	Sheep		-	0.82
	Others (Camel, Pig, Yak, Horse, Monkey etc.)		-	10.20
	Commercial dairy farms (Number)	-	-	-
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000) 141.295</b>	
	Commercial	383	89270	
	Backyard	167	14807	
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>			

<b>A. Capture</b>						
i) <b>Marine</b> (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
ii) <b>Inland</b> (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
<b>B. Culture</b>						
				Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)
i) <b>Brackish water</b> (Data Source: MPEDA/ Fisheries Department)						
ii) <b>Fresh water</b> (Data Source: Fisheries Department)						

### 1.11 Production and Productivity of major crops (Average of last 5 years: 2004 - 08)

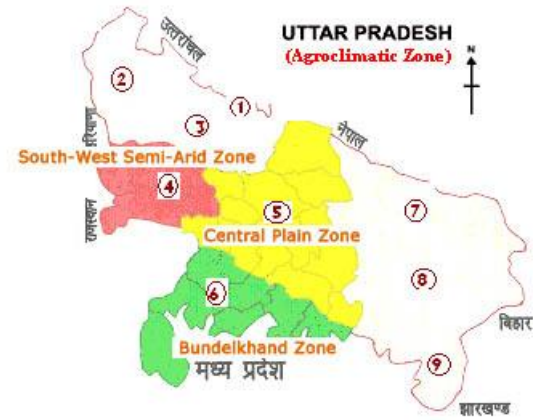
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops identified based on total acreage)</b>										
	Rice	205	2030	-	-	-	-	205	2030	-
	Sorghum	120	1091	-	-	-	-	120	1091	-
	Maize	561	1007	-	-	-	-	561	1007	-
	Pigeon pea	413	765	-	-	-	-	413	765	-
	Wheat	-	-	-	-	-	-	291	2209	-
	Pea	-	-	162	938	-	-	162	938	-
	Lentil	-	-	295	938	-	-	295	938	-
	Mustard	-	-	73	773	-	-	73	773	-
	Potato	-	-	549	210	-	-	549	210	-

<b>1.12</b>	<b>Sowing window for 5 major field crops</b> (start and end of normal sowing period)	<b>Rice</b>	<b>Maize</b>	<b>Wheat</b>	<b>Lentil</b>
	Kharif- Rainfed	3 <sup>rd</sup> week of June – 3 <sup>rd</sup> week of July	2 <sup>nd</sup> week of June – 4 <sup>th</sup> week of June		
	Kharif-Irrigated	4 <sup>th</sup> week of June – 2 <sup>nd</sup> week of August	3 <sup>rd</sup> week of June – 3 <sup>rd</sup> week of July		
	Rabi- Rainfed			3 <sup>rd</sup> week of October – 3 <sup>rd</sup> week of November	1 <sup>st</sup> week of October – 4 <sup>th</sup> week of October
	Rabi-Irrigated			3 <sup>rd</sup> week of November – 4 <sup>th</sup> week of December	

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular</b>	<b>Occasional</b>	<b>None</b>
	Drought		√	
	Flood		√	
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave		√	
	Frost			√
	Sea water intrusion		√	
	Pests and disease outbreak		√	

<b>1.14</b>	<b>Include Digital maps of the district for</b>	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

## Annexure I



### Agroclimatic Zones of U.P.

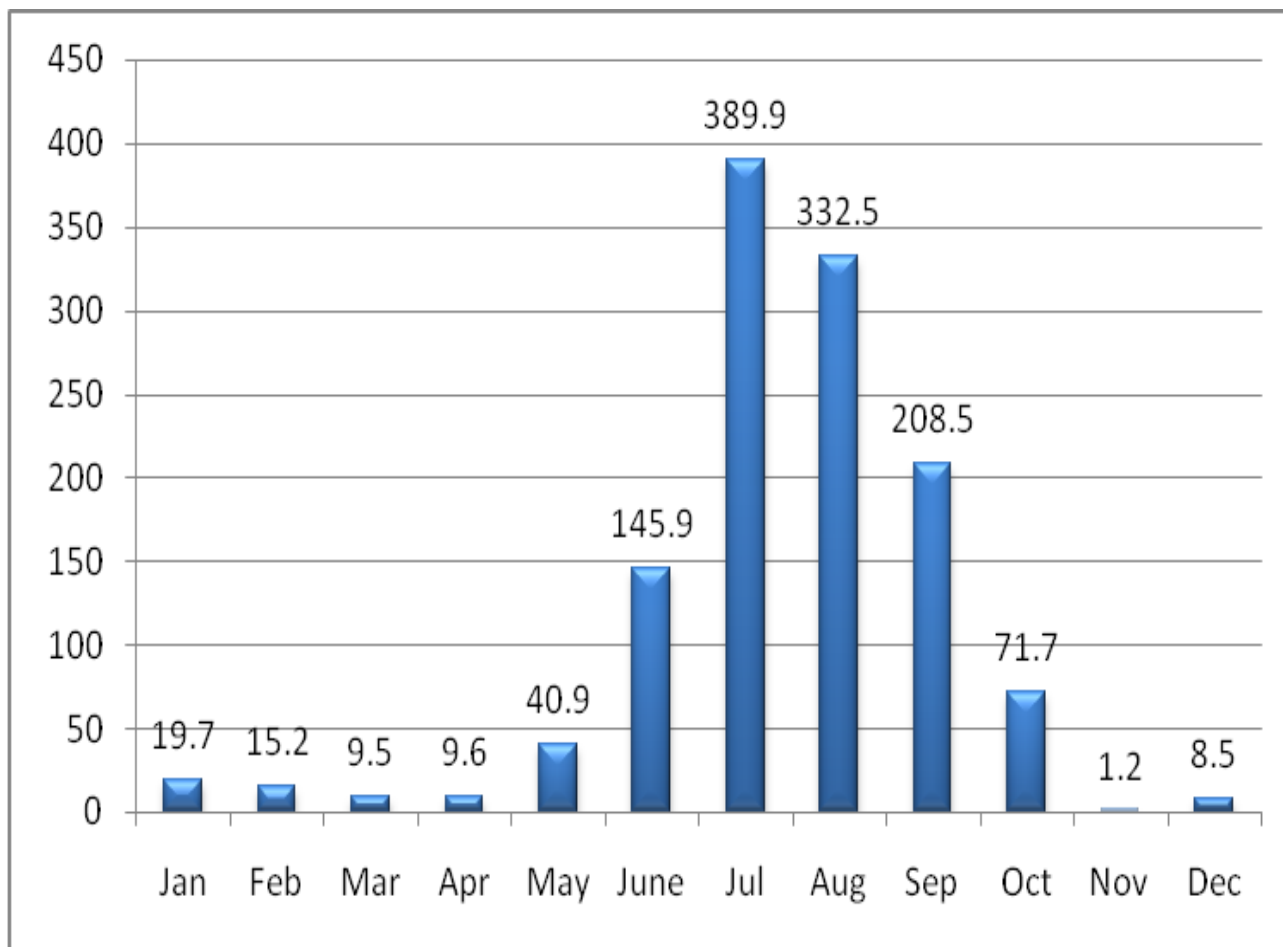
- |                             |
|-----------------------------|
| 1. Bhabhar and Tarai Zone   |
| 2. Western Plain Zone       |
| 3. Mid Western Plain zone   |
| 4. South Western Plain Zone |
| 5. Central Plain Zone       |
| 6. Bundelkhand Zone         |
| 7. North Eastern Plain Zone |
| 8. Eastern Plain Zone       |
| 9. Vidhya Zone              |

# UTTAR PRADESH

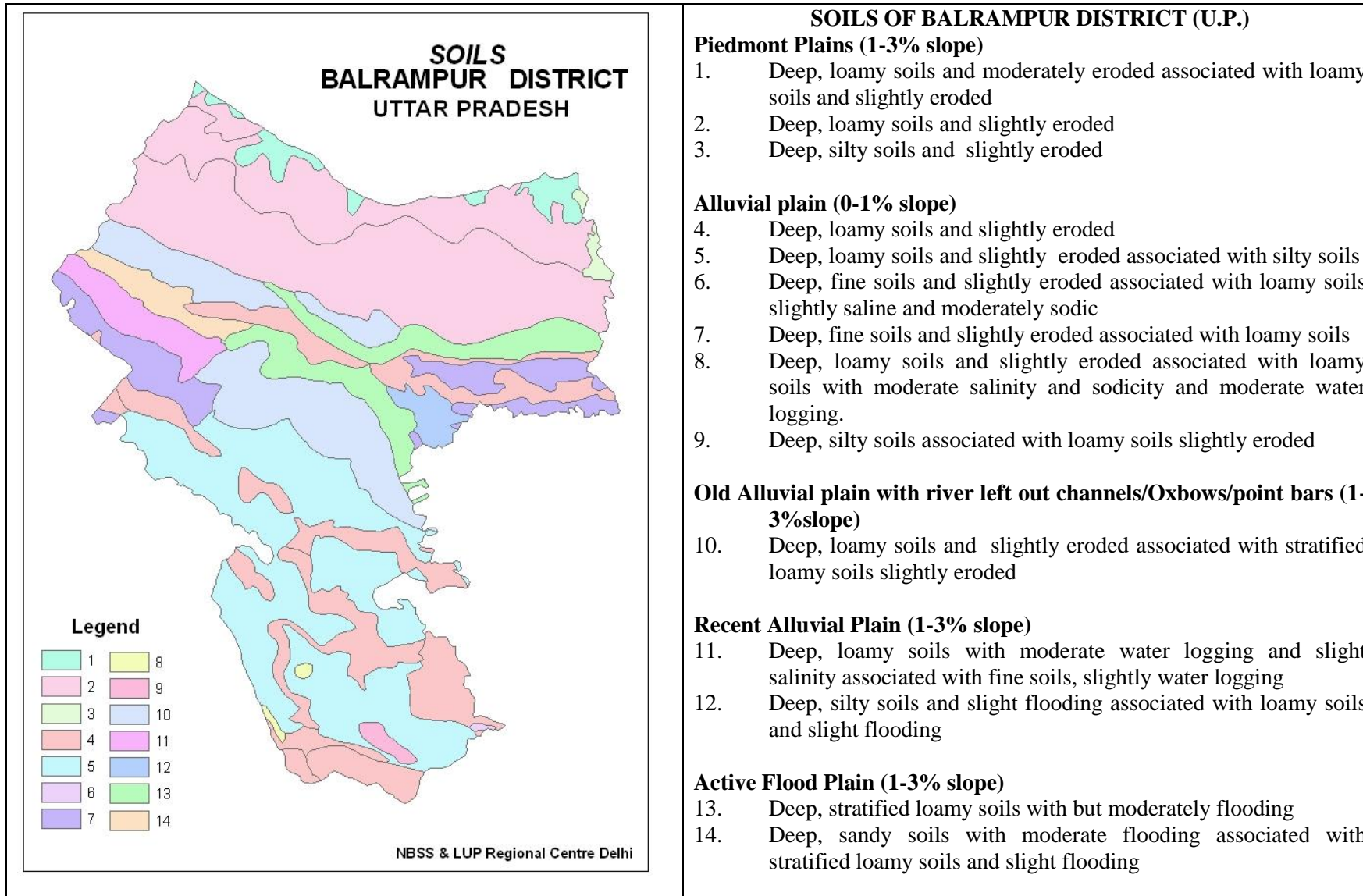




**Annexure II**



Annexure III



**SOILS OF BALRAMPUR DISTRICT (U.P.)**

**Piedmont Plains (1-3% slope)**

1. Deep, loamy soils and moderately eroded associated with loamy soils and slightly eroded
2. Deep, loamy soils and slightly eroded
3. Deep, silty soils and slightly eroded

**Alluvial plain (0-1% slope)**

4. Deep, loamy soils and slightly eroded
5. Deep, loamy soils and slightly eroded associated with silty soils
6. Deep, fine soils and slightly eroded associated with loamy soils slightly saline and moderately sodic
7. Deep, fine soils and slightly eroded associated with loamy soils
8. Deep, loamy soils and slightly eroded associated with loamy soils with moderate salinity and sodicity and moderate water logging.
9. Deep, silty soils associated with loamy soils slightly eroded

**Old Alluvial plain with river left out channels/Oxbows/point bars (1-3% slope)**

10. Deep, loamy soils and slightly eroded associated with stratified loamy soils slightly eroded

**Recent Alluvial Plain (1-3% slope)**

11. Deep, loamy soils with moderate water logging and slight salinity associated with fine soils, slightly water logging
12. Deep, silty soils and slight flooding associated with loamy soils and slight flooding

**Active Flood Plain (1-3% slope)**

13. Deep, stratified loamy soils with but moderately flooding
14. Deep, sandy soils with moderate flooding associated with stratified loamy soils and slight flooding

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks 1 <sup>st</sup> week of July	Deep loamy soils (tarai soils)	Rice	Rice Transplanting/Direct seeding of Medium and Short duration varieties of Rice Such as NDR-97, NDR-359,NDR-80,NDR-118, Baranideep etc.	Raise Staggered rice nursery should be grown at 15 days interval in small areas at least two times	-
	Sandy loam soils	Maize	Maize	Intercropping/ mixed cropping of maize/sorghum/ Pearlmillet with long duration varieties of Pigeonpea	
		Pigeonpea	Pigeonpea	Sowing on raised beds, Intercropping with Maize/Blackgram/Greengram	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					

Delay by 4 weeks 3 <sup>rd</sup> week of July	Deep loamy soils (tarai soils)	Rice-Wheat	Rice-Wheat Transplanting/Direct seeding of Medium and Short duration varieties of Rice Such as NDR-97, NDR- 359,NDR-80,NDR-118, Baranideep, Govind,Saket-4, Ratna,IR-36 and Pant-12 etc.	<ul style="list-style-type: none"> <li>•Direct seedling of short duration varieties of Rice such as NDR-97, NDR-80, NDR-118, Saket-4</li> <li>•Raise Staggered rice nursery should be grown at 15 days interval in small areas at least two times</li> <li>•Adopt SRI system of nursery raising</li> <li>•Transplanting of Rice (beyond 20<sup>th</sup> July) with 3-4 seedlings/hill to increasing the plant population of 60 hills/m<sup>2</sup>, instead of 50 hills/m<sup>2</sup></li> <li>•Pruning of over aged Rice seedlings for better establishment and optimum plant stand</li> <li>•Foliar praying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops</li> </ul>	<ul style="list-style-type: none"> <li>• Seed-drill under RKVY</li> <li>• Supply of seed through govt. agencies <i>ie.</i> NFSM,RKVY</li> </ul>
	Sandy loam soils	Maize	Maize Maize-Prakash, Sartaj, Naveen, Tarun.	<p>Maintain weed free condition for soil moisture conservation</p> <p>Intercropping/ mixed</p>	

				cropping of maize with long duration varieties of Pigeonpea	
		Pigeonpea	No change	Sowing on raised beds  Intercropping with Maize/Blackgram/Greengram	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					
Delay by 6 weeks 1 <sup>st</sup> week of August	Deep loamy soils (tarai soils)	Rice-Wheat	Rice-Wheat  Paddy: Short duration varieties of paddy such as NDR-97, NDR-80,NDR-118, Pant Dhan-12 should be transplanted/direct seeding.	Direct seeding of rice  In case of late transplanting of rice(beyond 20 <sup>th</sup> July) planting should be dense by increasing the number of seedlings/hill from 2 to 3 to 3 to 4.  Adopt SRI system of nursery raising  Weeding and interculture  Foliar spraying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops	<ul style="list-style-type: none"> <li>• Seed-drill under RKVY</li> <li>• Supply of seed through govt. agencies <i>ie.</i> NFSM,RKVY</li> </ul>

				Life saving irrigation in transplanted rice	
	Sandy loam soils	Maize	Greengram/ Blackgram Greengram: T-44, Pant mung-1, Narendra mung-1 Blackgram : Narendra urd-1,Pant urd-25	Intercropping/ mixed cropping of Greengram/ Blackgram/ maize/sorghum/ Pearlmillet with long duration varieties of pigeonpea Sorghum+green gram(2:2)	
		Pigeonpea	Pigeonpea: Bahar	Maize (Tipekhiya) in Pigeonpea(Narendra Arhar-1) crop in 1:1 row ratio Sowing on raised beds Intercropping with Maize/Blackgram/Greengram Pigeonpea+ Blackgram/Greengram (1:3)	

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset)					

Delay by 8 weeks 3 <sup>rd</sup> week of August	Deep loamy soils (tarai soils)	Rice-Wheat	<p>Preference should be given for sowing of Pearlmillet and Sesame</p> <p>Pearlmillet: Pusa 322, 323(Hybrid) and WCC-75, Raj-171(Composite)</p> <p>Sesame: - Type-4, Type-78, Type-12</p> <p>Greengram : T-44, Pant mung-1, Pant mung-2, Samrat, Malviya, Janpriya, Malviya jyoti, Narendra mung-1</p>	<p>Direct sowing</p> <p>In case of late transplanting of rice(beyond 20<sup>th</sup> July) planting should be dense by increasing the number of seedlings/hill from 2 to 3 to 3 to 4.</p> <p>Foliar praying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops</p> <p>Life saving irrigation in transplanted rice</p>	<ul style="list-style-type: none"> <li>• Seed-drill under RKVY</li> <li>• Supply of seed through govt. agencies <i>ie.</i> NFSM,RKVY</li> </ul>
	Sandy loam soils	Maize	<p>Blackgram : Narendra urd-1,Pant urd-25, Pant urd-19, Uttara, Type-9</p>	<p>Intercropping/ mixed cropping of Greengram/ Blackgram/maize/sorghum/ Pearlmillet with long duration varieties of pigeonpea</p> <p>Land preparation for sowing of early rabi crops like potato,toria,lahi and mustard</p>	
		Pigeonpea	<p>September Pigeonpea Varieties Bahar, PDA-11, Pusa-9 should be done till 1<sup>st</sup></p>	-	

			week of September.		
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			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 loamy soils (tarai soils)	Rice	After seeding of rice if there is break of monsoon by 7 to 10 days and if seedling mortality is observed then re-sowing with the same variety	Weeding at critical stages	<ul style="list-style-type: none"> <li>• Supply of inter cultural implements through RKVY</li> <li>• Farm ponds through IWSM programme</li> <li>• Pulse crop seeds supply through NFSM</li> </ul>
			Gap filling/transplanting in rice	Foliar praying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops	
	Using “Sanda” method, plant population can be maintained with sufficient number of tillers in late drought condition as to minimize the production losses	Life saving irrigation			
	Sandy loam soils	Maize	Ridge sowing	Leaf mulching to conserve the soil moisture	
Gap filling/ Thinning to maintain optimum plant population					
		Pigeonpea	Ridge sowing	Leaf mulching to conserve the soil moisture	
			Gap filling/ Thinning to maintain optimum plant population		



Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			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	Deep loamy soils (tarai soils)	Rice	<p>Gap filling/transplanting in rice</p> <p>Foliar spraying of 2% urea to boost up the growth</p>	<p>Weeding as to conserve the residual soil moisture</p> <p>Leaf mulching to conserve the soil moisture</p> <p>Foliar spraying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops</p> <p>Life saving irrigation from the stored water during the rainy season.</p> <p>Proper electricity monitoring/rostering system should be ensured in area for regular supply of electricity for pumping of water for life saving</p>	-

				irrigation	
	Sandy loam soils	Maize	Thinning to maintain proper distance between the plants. Frequent interculture Earthing up in Pigeonpea Foliar spraying of 2% urea to boost up the growth	Foliar spraying of 2% MOP to increase the resistance to drought  Leaf mulching to conserve the soil moisture  Conservation furrow  Life saving irrigation	
		Pigeonpea		-	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Deep clay loam soils	Rice	Foliar spraying of 2% urea to boost up the growth	Weeding as to conserve the residual soil moisture  Leaf mulching to conserve the soil moisture  Foliar spraying of 2.5 kg Urea + 2.5 kg Potash as to increase the drought tolerance in nursery / standing crops  Life saving irrigation from the	-

				<p>stored water during the rainy season.</p> <p>Proper electricity monitoring/rostering system should be ensured in area for regular supply of electricity for pumping of water for life saving irrigation</p>	
		Maize	Thinning to maintain proper distance between the plants.	Foliar spraying of 2% MOP to increase the resistance to drought	
		Pigeonpea	<p>Frequent interculture</p> <p>Earthing up in Pigeonpea</p> <p>Foliar spraying of 2% urea to boost up the growth</p>	<p>Leaf mulching to conserve the soil moisture</p> <p>Conservation furrow</p> <p>Life saving irrigation</p>	

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)					

	Deep clay loam soils	Rice	<p>Alternate management of irrigation should be ensured for provide life saving irrigation</p> <p>Proper electricity monitoring/ rostering system should be ensured in area for regular supply of electricity for pumping of water for life saving irrigation</p>	<p>Better pulverization should be made for conservation of soil moisture following by planking for sowing of early rabi crops like toria and potato etc..</p> <p>Toria variety- type-9, type-36, PT-303, PT-30 and ageti Rai should be sown in 1<sup>st</sup> week of September while Bhawani variety can be sown in 2<sup>nd</sup> week of September.</p> <p>In fallow fields to sow Ageti rai, potato varieties like Kufri Ashoka, Kufri Chandra mukhi and other vegetable crops like spinach,reddish coriander etc.</p>	
		Maize	<p>Harvesting of intercrop at physiological maturity (Maize, Blackgram and Greengram)</p> <p>Earthing up of Pigeonpea</p> <p>Harvesting of green cobs (maize) and sell in market and remaining portion will be used for fodder.</p> <p>Life saving irrigation to pigeonpea if possible.</p>	<p>Better pulverization should be made for conservation of soil moisture following by planking for sowing of early rabi crops like toria and potato etc..</p> <p>Toria variety- type-9, type-36, PT-303, PT-30 and ageti Rai should be sown in 1<sup>st</sup> week of September while Bhawani variety can be sown in 2<sup>nd</sup> week of September.</p>	

		Pigeonpea		-	
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### 2.1.2 Drought - Irrigated situation

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Deep clay loam soils	Rice – Wheat / Pea/ Lentil	Short duration rice varieties- NDR 97, Ratna, Narendra 118, Narendra 97, Pant Dhan 12, HUR 105, Induri Sambha, HUR 2-1, HUR-3022 to be grown under aerobic condition.	<p>Community nursery</p> <p>Direct seeding in small beds.</p> <p>Use of micro-irrigation systems viz. sprinkler &amp; sub-surface irrigation.</p> <p>Silting of canal water/ Govt. Tubewell for reaching the water at end tail</p>	<p>Breeder's seed will be supplied by BHU and NDUAT, Faizabad.</p> <p>Seed drills RKVY and supply of seeds NFSM</p>

Limited release of water in canals due to low rainfall	Sandy clay loam soils	Rice – Wheat / Pea/ Lentil	<p>Rice\ Maize \ Sorghum</p> <p>Grow short duration aerobic rice such as NDR 97, NDR 118, Govind, Vandana, Varanideep, Susk Samrat , HUR 105</p> <p>Maize: Malviya hybrid Makka-2, Naveen &amp; Jaunpuri Pearl millet : WCC 75, Raj 171, Pusa 23 Sorghum: CSH-16, CHS-9, CHS-14, CSV-13 &amp; CSV-15 should be grown on ridges for fodder/grain purposes.</p>	<p>Community nursery,</p> <p>Direct seeding in small beds.</p> <p>Use of micro-irrigation systems viz. sprinkler &amp; sub-surface irrigation.</p>	
Non release of water in canals under delayed onset of monsoon in catchment	Sandy clay loam soils	Rice – Wheat / Pea/ Lentil	<p>Shift to only aerobic rice Or Rice may be replaced by pulses Greengram: Pant Mung -8, PDM-11, Samrat, Jyoti, Jagriti, Janpriya, Jan Chetana &amp; Jan Kalyani Blackgram: Type 9, Pant U 19, Pant U 35, Narendra Urd 1 &amp; Azad Urd-3 Sesame :Type 4, T-12, T-13, Shekhar, GT1, TC 25 &amp; TC 289</p>	<p>Direct seeding in small beds.</p> <p>Use of micro-irrigation systems viz. sprinkler &amp; sub-surface irrigation.</p>	

Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Sandy clay loam soils	Rice – Wheat / Pea/ Lentil	Sorghum\ Pearl millet	<p>Conservation tillage,</p> <p>Sowing of Pearl millet &amp; Sorghum for grain purposes at 45 cm on ridges.</p> <p>Foliar application of 2% MOP</p> <p>Use of mulches (straw/dust).</p> <p>Canal and tubewell channel should be kept properly cleaned(free of weeds) and should be ensured before watering as to increase the water use efficiency</p>	
Insufficient groundwater recharge due to low rainfall	Sandy clay loam soils	Rice – Wheat / Pea/ Lentil	Rice should be replaced with pulses (green gram & black gram), oilseeds (Sesame) in <i>Kharif</i> and wheat by Chickpea & lentil in <i>Rabi</i> season.	Direct seeding in small beds.	

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

Condition	Suggested contingency measure			
	Vegetative stage <sup>k</sup>	Flowering stage <sup>l</sup>	Crop maturity stage <sup>m</sup>	Post harvest <sup>n</sup>
Continuous high rainfall in a short span leading to water				

<b>logging</b>				
Rice	Provide drainage	Proper bunding, drain out excess water	Harvesting at physiological maturity	Shift to safer place
Wheat	Provide drainage	Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Pigeonpea	Provide drainage and Practice of sowing on ridges	Make inter-row furrow to Drain out excess water	Harvesting at physiological maturity	Shift to safer place
<b>Heavy rainfall with high speed winds in a short span<sup>2</sup></b>	-	-	-	-
<b>Outbreak of pests and diseases due to unseasonal rains</b>				
Rice, Wheat, Chickpea, Pigeonpea, Pearl millet	Need based plant protection (integrated pest and disease management)	Need based plant protection (integrated pest and disease management)	Need based plant protection (integrated pest and disease management)	Safe storage against stored grain pest and diseases

### 2.3 Floods

Condition	Suggested contingency measure <sup>o</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
<b>Transient water logging/ partial inundation<sup>1</sup></b>				
Rice	• Provide drainage	• Removal of excess water	• Foliar spray of 5% urea	
Maize	Provide drianage , Creation of surface drains at appropriate places to avoid water logging			
<b>Continuous submergence for more than 2 days<sup>2</sup></b>				



Rice	<ul style="list-style-type: none"> <li>• Drainage of excess water through drainage channel</li> <li>• Transplanting of deep water rice –Madhupur, Jalmagn, Jalpriya, Jalnidhi, Awarodhi</li> </ul>	<ul style="list-style-type: none"> <li>• Just after finishing of floods, top dressing of urea could be ensured in the field</li> </ul>	<ul style="list-style-type: none"> <li>• Foliar spray of 5% urea</li> </ul>	<ul style="list-style-type: none"> <li>• Preference should be given for planting of Autumn Sugarcane in the month of Oct so that their grand growth completed to the maxi. Extent prior to floods.</li> <li>• Planting of Sugarcane on raised beds instead of flat bed.</li> <li>• Emphasis could be given for cultivation of Toria, Urd, Mung/Sunflower</li> </ul>
Sea water intrusion	Not Applicable			

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	Not applicable			
Cold wave				
Wheat	Provide light irrigation	Provide light irrigation	Provide light irrigation	-
Pigeonpea	Mulching	Light irrigation for survival	Light irrigation for survival	Harvesting at physiological maturity
<b>Frost:</b>	<b>Not applicable</b>			
<b>Hailstorm:</b>	<b>Not applicable</b>			
<b>Cyclone:</b>	<b>Not applicable</b>			

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	Suggested contingency measures		
	Before the event <sup>s</sup>	During the event	After the event
<b>Drought</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>• Storage of straw and silage in silo pit according to population of animal</li> </ul>		
Drinking water	<ul style="list-style-type: none"> <li>• Maintenance and inspection of Tubewells, Hand pumps, Ponds, Tanks etc.</li> </ul>		
Health and disease management	<ul style="list-style-type: none"> <li>• Vaccination of animals against FMD, HS, B.Q. and De warming</li> </ul>		
<b>Floods</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>• Increase the area of fodder</li> </ul>	<ul style="list-style-type: none"> <li>• Provide safe place for the animals</li> </ul>	<ul style="list-style-type: none"> <li>• Sowing of rabi fodder crops like - Berseem, Lucerne, Oat and other rabi crops</li> </ul>
Drinking water	<ul style="list-style-type: none"> <li>• Crops according to population and their storage</li> </ul>	<ul style="list-style-type: none"> <li>• Distribution of stored feed and fodders according to the population</li> </ul>	<ul style="list-style-type: none"> <li>• Drain of infected stored water and supply of fresh water for drinking.</li> </ul>
Health and disease management	<ul style="list-style-type: none"> <li>• Arrangement of clean drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Provide neat &amp; clean drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Proper treatment of affected (animals vaccination &amp; Dewarming)</li> </ul>
<b>Cyclone</b>			
Feed and fodder availability	<ul style="list-style-type: none"> <li>• Arrangement of clean drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Organize health camp regularly</li> </ul>	-
Drinking water			
Health and disease management			
<b>Heat wave and cold wave</b>			
Shelter/environment management	<ul style="list-style-type: none"> <li>• Shelter house/Farm house should not face directly</li> </ul>	<ul style="list-style-type: none"> <li>• Proper availability of shelter, drinking water and feeds &amp; fodder as per need of the animals</li> </ul>	<ul style="list-style-type: none"> <li>• Provide shelterbelts of good quality materials</li> </ul>

Health and disease management	<ul style="list-style-type: none"> <li>•Ensure the availability of drinking water and as well as electrolytes</li> </ul>		<ul style="list-style-type: none"> <li>•Routine health check up by veterinary doctors</li> </ul>
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## 2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event <sup>a</sup>	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients				
Drinking water	<ul style="list-style-type: none"> <li>• Deep tube well provide clean drinking</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the drinking water</li> </ul>	
Health and disease management	<ul style="list-style-type: none"> <li>• Vaccination against infectious diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination for infectious diseases such as- Ranikhet, infectious Coryza, IBD, ILT</li> </ul>	
<b>Floods</b>				
Shortage of feed ingredients	<ul style="list-style-type: none"> <li>• Inspection of established Tubewell &amp; other water sources</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the drinking water</li> </ul>	
Drinking water	<ul style="list-style-type: none"> <li>• Vaccination against infectious diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination for infectious diseases such as- Ranikhet, infectious Coryza, IBD, ILT</li> </ul>	
Health and disease management				
<b>Cyclone</b>				
<b>Heat wave and cold wave</b>				
Shelter/environment management	<ul style="list-style-type: none"> <li>• Arrangement of proper shelter and cooler/heater to maintain the proper temp. of the shelter house</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of surrounds temp. and prevent the birds from direct exposure of heat/ cold waves</li> </ul>	<ul style="list-style-type: none"> <li>• Heat check up</li> </ul>	

Health and disease management	• Vaccination	• Vaccination	• Vaccination • Availability of neat & clean water	
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<sup>a</sup> based on forewarning wherever available

### 2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine			
Inland	Arrange for alternative water resources	Sell the produce at minimum acceptable size to the consumer	Lime Application
(i) Shallow water depth due to insufficient rains/inflow	Stocking of Air breathing		
(ii) Changes in water quality		Increased water temperature	
(iii) Any other		Decrease dissolve oxygen	
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow	Arrange for alternative water resources	Minimum disturbance to the fish i.e. minimum fishing activities	Maintain the pond properly by liming, manuring and fertilization
(ii) Impact of salt load build up in ponds / change in water quality			
<b>2) Floods</b>			
<b>A. Capture</b>			
Marine			
Inland	Harvest the large size fish	Protect the escape of fish	Manage the inlet, outlet structures along with pond land
(i) No. of boats / nets/damaged			
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
<b>B. Aquaculture</b>			

(i) Inundation with flood water	Make 2.5 m high bylonnet boundry on the band of pond	Check for outlet to remain open	Close outlet and open inlet
(ii) Water contamination and changes in water quality		Close inlet and divert water receiving channel	Treatment of water with Alum and $KmnO_4$
(iii) Health and diseases			Feeding, liming, manuring and fertilization of ponds
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
<b>3. Cyclone / Tsunami</b>			
<b>A. Capture</b>			
<b>B. Aquaculture</b>			
(i) Overflow / flooding of ponds		Stocking of fish sped for a period of 1-2 month	
(ii) Changes in water quality (fresh water / brackish water ratio)	Liming	Lime+alum	Harvesting and selling fish seeds
(iii) Health and diseases		Lime+alum	
(iv) Loss of stock and inputs (feed, chemicals etc)			Netting of fish+ $KmnO_4$ application
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
<b>4. Heat wave and cold wave</b>			
Not Applicable			