

State: Uttar Pradesh

Agriculture Contingency Plan for District: Hardoi

1.0 District Agriculture profile				
1.1	Agro-Climatic/ Ecological Zone			
	Agro-Ecological Sub Region(ICAR)	Central Plain Zone		
	Agro-Climatic Zone (Planning Commission)	Upper Gangetic Plain Region		
	Agro-Climatic Zone (NARP)	UP-4 Central Plain Zone		
	List all the districts falling the NARP Zone* (^ 50% area falling in the zone)	Lakhimpur, Kheri, Sitapur, Hardoi, Farrukhabad, Etawah, Kanpur, Kanpur Dehat, Unnao, Lucknow, Rae Bareilly, Fatehpur and Allahabad.		
	Geographical coordinates of district headquarters	Latitude	Latitude	Latitude(mt)
		27.57N	80.46E	
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS	-		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Tatyora, Near Polytechnic, Hardoi		
Name and address of the nearest Agromet Field Unit(AMFU,IMD)for agro advisories in the Zone	CSA 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)	767.9		2 nd week of June	4th week of September
	Post monsoon (Oct-Dec)	45.8			
	Winter (Jan-March)	41.6		-	-
	Pre monsoon (Apr-May)	19.5		-	-
	Annual	874.8			

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)	598.9	514.2	12.3	54.6	4.8	11.2	10.8	13.0	39.1	19.8

1.4	Major Soils	Area('000 hac)	Percent(%) of total
	Deep, loamy sodic soil slightly eroded	303.4	59%
	Silty soils, silty sodic moderate eroded	123.4	24%
	Deep, silty soils,	46.3	9%
	Deep loamy water logging	41.1	8%

1.5	Agricultural land use	Area('000 ha)	Cropping intensity (%)
	Net sown area	433.3	130
	Area sown more than once	237.4	
	Gross cropped area	670.6	

1.6	Irrigation	Area('000 ha)		
	Net irrigation area	385.3		
	Gross irrigated area	553.2		
	Rain fed area	48.0		
	Sources of irrigation(Gross Irr. Area)	Number	Area('000 ha)	Percentage of total irrigated area
	Canals		79.5	14.4
	Tanks		0.1	
	Open wells		17.2	3.1
	Bore wells(Tube wells)		455.8	82.4
	Lift irrigation schemes		NA	
	Micro-irrigation		NA	
	Other sources		0.6	0.1
	Total Irrigated Area		553.2	
	Pump sets (2011-12)	88127		
	No. of Tractors	7764		
	Groundwater availability and use* (Data source: State/ Central Ground water Department/ Board)	No of blocks- Tehsils-	(%)area	Quality of water
	Over exploited			
	Critical			
	Semi-critical			
	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)							Total
		Kharif			Rabi			Summer	
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
Rice	144.6	0.6	145.2	0	0	0	0.03	145.2	
Wheat	0	0	0	331.4	0.03	331.4	0	331.4	
Maize	1.1	36.1	37.2	-	-	-	-	37.2	
Masoor	-	-	-	0.7	8.3	9.0	-	9.0	
Rapeseed Mustard	-	-	-	11.2	0.8	12.0	-	12.0	
Sugarcane	32.5	0.001	32.5	-	-	-	-	32.5	

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

1.7	Major field crops cultivated	Area('000 ha)								Crop residue as fodder ('000 tons)
		Kharif		Rabi		Summer		Total		
		Production ('000 T)	Productivity (KG/HA)	Production ('000 T)	Productivity (KG/HA)	Production ('000 T)	Productivity (KG/HA)	Production ('000 T)	Productivity (KG/HA)	
Rice	314.0	2112	-	-	-	-	314.0	2112	NA	
Wheat	-	-	1073.1	3233	-	-	1073.1	3233	NA	
Maize	59.8	1384	-	-	-	-	59.8	1384	NA	
Masoor	-	-	9.2	940	-	-	9.2	940	NA	
Rapeseed Mustard	-	-	11.8	970	-	-	11.8	970	NA	
Sugarcane	1730.7	51012	-	-	-1-	-	1730.7	51012	NA	

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	6.0	6.0	-
	Guava	0.170	0.170	-
	Horticulture crops - Vegetables	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Potato	11.1	11.1	-
	Onion	0.6	0.6	-
	Pea	0.9	0.9	-

1.7	Major Fodder crops cultivated	Area(ha)	Total
	Kharif	3697	3697
	Rabi	2301	2301
	Summer	453	453
	Total	6451	6451

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)	
	Rice	102.8	2015	-	-	-	-	102.8	2015	NA
	Wheat	-	-	228.1	2717	-	-	228.1	2717	NA
	Juar	2.3	818	-	-	-	-	2.3	818	NA
	Masoor	-	-	1.8	840	-	-	1.8	840	NA
	Rapeseed Mustard	-	-	2.7	882	-	-	2.7	882	NA
	Potato	-	-	96.5	20471	-	+-	96.5	20471	NA

1.9 Livestock

Livestock(year 2007)	Male(000)	Female(000)	Totat(000)
Non descriptive Cattle (local low yielding)	260.746	282.100	542.846
Improved cattle	0.003	0.006	0.009
Crossbred Cattle	12.824	20.282	33.106
Non descriptive Buffaloes (local low yielding)	50.465	162.205	212.670
Descript Buffaloes	54.186	197.261	251.447
Goat	160.143	224.167	384.310
Sheep			23.693
Other (Camel,Pig, Yak etc)			37.778
Commerical dairy farms (number)			0.000

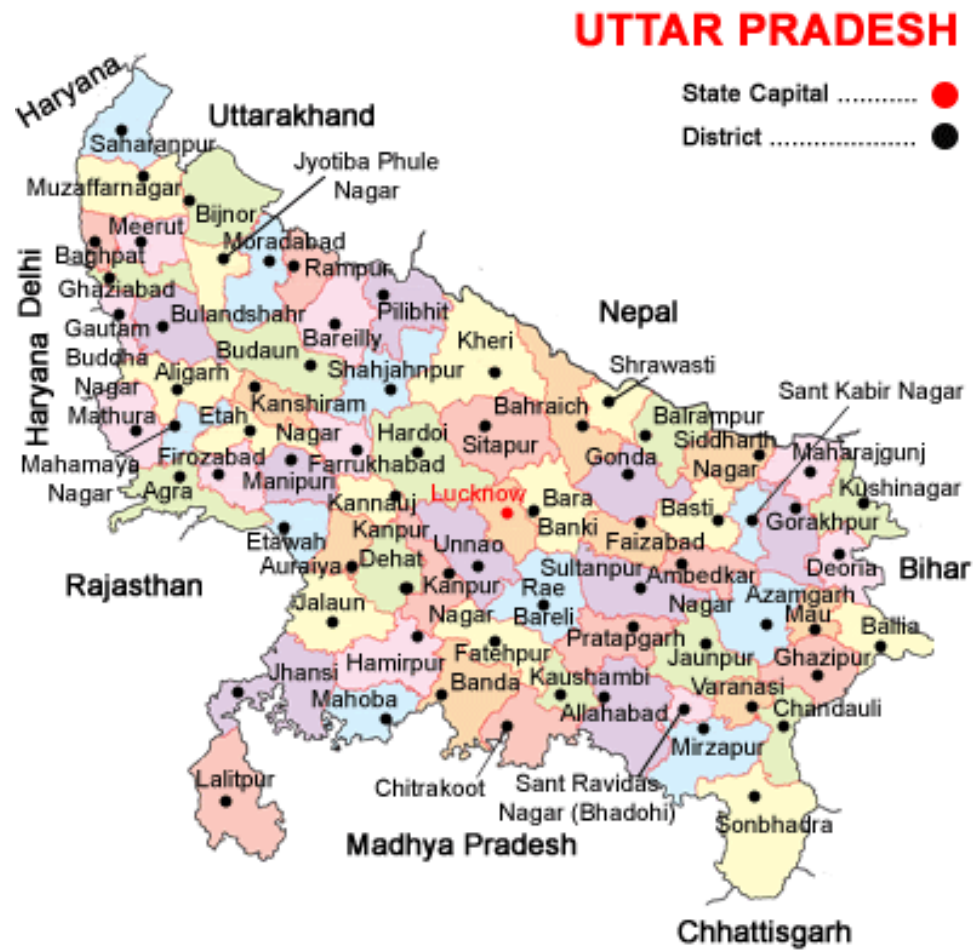
1.12	Sowing window for 5 major field crops	Rice	Maize	Black gram	Pigeon pea	Groundnut	Sesame	Wheat	Potato	Mustard	Pea
	Kharif – Rainfed	3 rd week of June to last week of July	3rd week of June to 2nd week of July	First week of July to 2 nd week of August	Fourth week of July to 2 nd week of August	Last week of June to 2 nd week of July	Second week of July to last week of July	-	-	-	-
	Kharif - Irrigated	3 rd week of June to last week of July	3rd week of June to 2nd week of July	-				-	-	-	-
	Rabi – Rainfed							-	Second week of Oct to Third week of Oct	2 nd week of Oct first week of Nov	2nd week of Sep to first week of Oct
	Rabi - Irrigated							3rd week of Nov to last week of Dec	-	2 nd week of Oct first week of Nov	2nd week of Sep to first week of Oct

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.			√

1.14	Include Digital maps of the district for	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

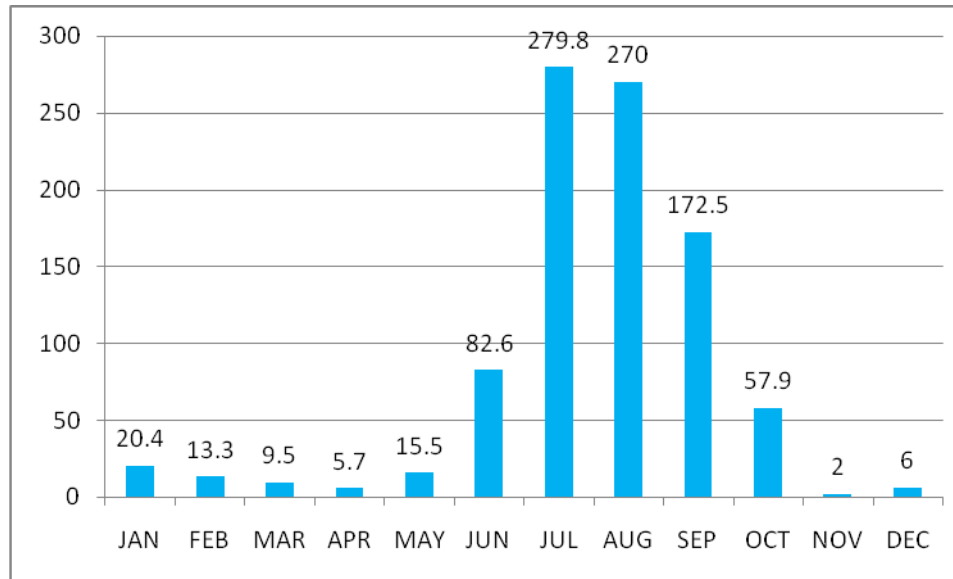
Annexure I

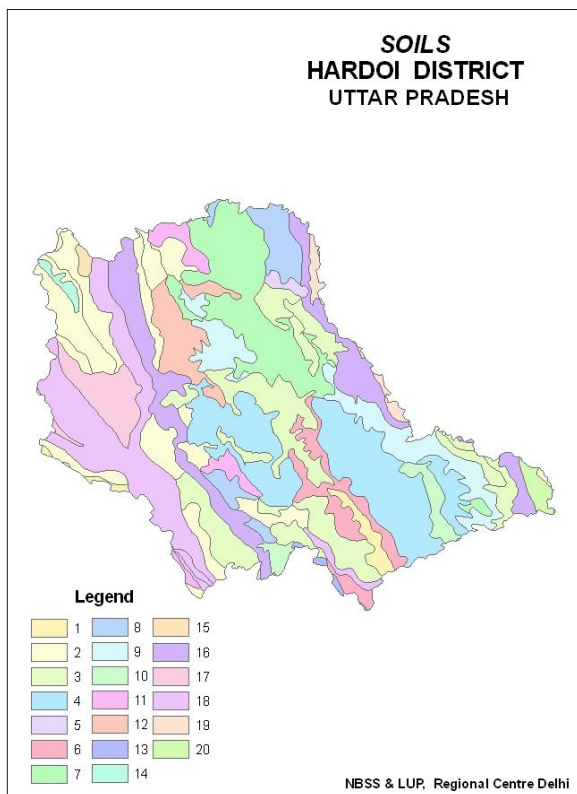
Location map of district



Annexure 2

Average month-wise rainfall (mm) in Hardoi district





Tarai (1-3% slope)

1. Deep, loamy soils and slightly eroded

Alluvial plain (0-1% slope)

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

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

12. Deep, loamy soils and slightly eroded associated with stratified loamy soils slightly eroded
13. Deep, fine soils, moderately saline /sodic associated with loamy soils with moderate salinity/sodicity

Recent Alluvial Plain (1-3% slope)

14. Deep, loamy soils with moderate water logging and slight salinity associated with fine soils, slightly water logging .
15. Deep, stratified loamy soils, with severe flooding associated with loamy soils with severe flooding
16. Deep, silty soils, moderately saline and sodic associated with loam soils and slightly eroded

Active Flood Plain (1-3% slope)

17. Deep, stratified loamy soils with but moderately flooding .
18. Deep, sandy soils with moderate flooding associated with stratified loamy soils and slight flooding
19. Deep, stratified loamy soils, with moderate flooding associated with sandy soils with moderate flooding

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

20. Deep, fine soils, slightly eroded associated with fine smectitic soils and slightly eroded.

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

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 (4 th week of June)	Deep, loamy partial sodic soil slightly eroded	Rice	No change Narendra 118, Narendra 80, NDR 359, CSR-30, CSR-36, CSR-43	Direct seeded rice, Transplanting	Linked with State Seed Corporation / CSSRI/SAUs
		Pigeonpea(UPAS 120)	Long duration varieties like Narendra Arhar 1, Narendra Arhar 2, Azad, Amar, MA-13 MA- 6 Intercropping of pigeonpea+urdbean (Azad Urd, Uttara, Narendra Urd 1, PU31, PU 19)	Raised bed planting Intercropping of pigeonpea(interrow spacing of 75 cm)- cm +Blackgram with row ratio of 1:2	Linked with State Seed Corporation / SAUs
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 (2 nd week of July)	Deep, loamy partial sodic soil slightly eroded	Rice	Sesame (Shekhar,Pragathi, Tarun) Black gram (Azad Urd, Uttara,Narendra Urd 1, PU31, PU 19)	Line sowing of sesame and urd bean	
		Pigeonpea(UPAS 120)	Long duration varieties like Narendra Arhar 1, Narendra Arhar 2, Azad, Amar,Malvi 13, Malvi 6 Intercropping of pigeonpea+urdbean (Azad Urd,Uttara,Narendra Urd 1, PU31, PU 19)	Raised bed planting Line sowing Intercropping of pigeonpea(interrow spacing of 75 cm)- cm +Black gram with row ratio of 1:2	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 6 weeks (4 th week of July)	Deep, loamy partial sodic soil slightly eroded	Rice	Sesame(Shekhar,Pragathi) Urdbean(Azad Urd,Uttara,Narendra Urd 1, PU31, PU 19)	Line sowing of sesame and urd bean	
		Pigeonpea(UPAS 120)	Long duration varieties like Narendra Arhar 1, Narendra Arhar 2, Azad, Amar,Malvi 13, Malvi 6 Intercropping of pigeonpea+ Black gram (Azad Urd,Uttara,Narendra Urd 1, PU31, PU 19)	Raised bed planting In sole pigeonpea, 20% higher seed rate) Intercropping of pigeonpea(interrow spacing of 75 cm)- cm + Black gram with row ratio of 1:2	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 weeks (2 nd week of August)	Deep, loamy partial sodic soil slightly eroded	Rice	Fallow	Moisture Conservation	
		Pigeonpea(UPAS 120)	Replace with long duration varieties NA-1, NA-2	Moisture Conservation	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset) Normal onset followed by 15-20 days dry spell after	Deep, loamy partial sodic soil slightly eroded	Rice	Life saving irrigation if available Weed Management	Mulching with locally available material/weeds	

sowing leading to poor germination/crop stand etc.		Pigeonpea(UPAS 120)	Weed Management & Gap filling/thinning		
--	--	---------------------	--	--	--

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^e
At vegetative stage	Deep, loamy partial sodic soil slightly eroded	Rice	Life saving irrigation if available Weed control	Foliar spray with 1% MoP Mulching with locally available material/weeds	
		Pigeonpea(UPAS 120)	Weed control Thinning to ,maintain optimum population	Mulching with locally available material/weeds	

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, loamy partial sodic soil slightly eroded	Rice	Harvest at physiological maturity	Conserve Moisture	
		Pigeonpea(UPAS 120) Maize	Harvest at physiological maturity Life saving irrigation if available	Conserve Moisture	

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, loamy partial sodic soil slightly eroded &	Paddy	Transplanting with 3 to 4 seedlings/hill	Drum seeding SRI method Irrigation at critical stages Reduce spacing plant to plant i.e.20x 15 cm	
		Groundnut Maize	No change	Weed control and intercultural Practices before pegging in GN & thinning in maize	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Deep, loamy partial sodic soil slightly eroded	Paddy	Transplanting with 3 to 4 seedlings/hill	Drum seeding SRI method Irrigation at critical stages Reduce spacing plant to plant i.e.20x 15 cm	
		Groundnut Maize	No change	Weed control and intercultural Practices before pegging in GN & thinning in maize & life saving irrigation at critical stages	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Deep, loamy partial sodic soil slightly eroded	Paddy	Transplanting with tube well irrigation 3 to 4 seedlings/hill	Drum seeding SRI method Irrigation at critical stages Reduce spacing plant to plant i.e.20x 15 cm	
		Groundnut Maize	No change	Weed control and intercultural Practices before pegging in GN & thinning in maize & life saving irrigation at critical stages	

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

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
Insufficient groundwater recharge due to low rainfall	Deep loamy soils-tube well irrigated	Paddy	Transplanting with tube well irrigation 3 to 4 seedlings/hill	Drum seeding SRI method Irrigation at critical stages Reduce spacing plant to plant i.e.20x 15 cm	
		Groundnut Maize	No change	Weed control and intercultural Practices before pegging in GN & thinning in maize & life saving irrigation at critical stages	

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Pigeonpea	Drain out excess water	-	Harvest at physiological maturity	
Urd	Drain out excess water	Drain out excess water	Harvest at physiological maturity	
Maize	Drain out excess water	Drain out excess water	Harvest at physiological maturity	
Groundnut	Drain out excess water	Drain out excess water	Harvest at physiological maturity	
Paddy	Strengthening of field bunds to store rain water for moisture conservation	Foliar application of 2% Urea & 1% KCl	Drain out excess water & Harvest at physiological maturity	

2.3 Floods-

Condition	Suggested contingency measure ^o			
Transient water logging/ partial inundation ¹	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Paddy	Replace the normal Var. with flood prone Variety Swarna Sub-1, MTU-7029 NDR359	Foliar application of Urea or neem coated Urea after drain the excess water	Management of Gandhi bug	Harvest at physiological maturity

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Floods	<p>In case of early forewarning (EFW), harvest all the crops (rice/maize/greengram/blackgram/maize etc) from low lying areas so that it will be useful as fodder in future (store properly)</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>Motivate the farmers to store a minimum required quantity of hay (25-50kg) and concentrates (25kgs) per animals in farmer / LS keepers house / shed for feeding animals during floods</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p> <p>List out the endemic diseases (species wise) in that district and store vaccines for those diseases</p>	<p>Transportation of animals to elevated areas</p> <p>Stall feeding of animals with stored hay and concentrates</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe floods, un-tether or let loose the animals</p> <p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Deworming with broad spectrum dewormers</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Proper disposable of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small</p>

			<p>ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p> <p>Preserve the sugar cane tops as silage</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>Allow for grazing between 10AM to 3PM during cold 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>Green and concentrates supplementation should be provided to all the animals.</p> <p>Allow the animals for grazing (normal timings)</p>

2.5.2 Poultry

Floods			
Shortage of feed ingredients	<p>In case of early forewarning of floods, shift the birds to safer place</p> <p>Storing of house hold grain like maize, broken rice, etc,</p>	<p>Use stored feed as supplement</p> <p>Don't allow for scavenging</p> <p>Culling of weak birds</p>	<p>Routine practices are followed</p> <p>Deworming and vaccination against RD</p>
Drinking water	Provide clean drinking water	Sanitation of drinking water	Sanitation of drinking water
Health and disease management	In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	<p>Prevent water logging surrounding the sheds through proper drainage facility</p> <p>Assure supply of electricity by generator or solar energy or biogas</p> <p>Sprinkle lime powder to prevent ammonia accumulation due to dampness</p>	<p>Sanitation of poultry house</p> <p>Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit</p> <p>Disposal of poultry manure to prevent protozoal problem</p> <p>Supplementation of coccidiostats in feed</p> <p>Vaccination against RD</p>

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