

State: CHHATTISGARH

Agriculture Contingency Plan for District: Koriya

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Moderately To Gently Sloping ChattisgarhMahanadi Basin, Hot Moist/Dry Subhumid Transitional ESR With Deep Loamy To Clayey Red And Yellow Soils (11.0) & Central Highlands (Malwa And Bundelkhand), Hot Subhumid (Dry) Eco-Region (10.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau And Hills Region (VII)		
	Agro Climatic Zone (NARP)	North Hill Zone of Chattisgarh (MP-3)		
	List all the districts falling under the NARP Zone*(*>50% area falling in the zone)	Koriya, Bilaspur, Jashpur, Surguja, Raigarh, Anupur, Dindori, Mandla, Seoni		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		23 ⁰ 2' N	82 ⁰ 33'	700 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RMD,College of Agriculture and Research Station -Ambikapur(C.G.)		
	Mention the KVK located in the district with address	Baikunthpur -Koriya		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMFU -RMD,College of Agriculture and Research Station -Ambikapur			

1.2	Rainfall	Normal RF(mm)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep)	1176	2 nd week of June	2 nd week of October
	NE Monsoon(Oct-Dec)	63	3 rd week of October	
	Winter (Jan- Feb)	50		
	Summer (Mar-May)	32.6		
	Annual	1315		

1.3	Land use pattern of the district	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('000 ha)	244.8	133.0	45.5		32.1	31.7				0

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	1.Extremely shallow soils		
	2.Very shallow soils		
	3. Shallow soils		
	4. Slightly deep soils		
	5. High deep soils		
	6.Deep solis		

* mention colour, depth and texture (heavy, light, sandy, loamy, clayey etc) and give vernacular name, if any, in brackets (data source: Soil Resource Maps of NBSS & LUP)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	133.0	141.7
	Area sown more than once	55.5	
	Gross cropped area	188.5	

1.6 Irrigation

Irrigation	Area ('000 ha)	Percent(%)	
Net irrigated area	8.2	6.1	
Gross irrigated area	22.8	12.1	
Rainfed area	131.1	81.7	

Sources of irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
Canals		10.9	
Tanks		2.0	
Open wells		3.5	
Bore wells		1.4	
Lift irrigation schemes			
Micro-irrigation			
Other sources (please specify)			
Total irrigated area		22832	12.10
Pump sets		-	
No. Of tractors		-	
Groundwater availability and use* (data source: state/central ground water department /board)	No. Of blocks/ tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
Over exploited		<70-100	
Critical		<70-100	
Semi- critical		<70-100	
Safe		<70-100	
Wastewater availability and use			
Ground water quality	70-100%		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%			

1.7 Area under major field crops & horticulture

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			Rabi			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Rice		64.2	64.2					64.2	
Maize		15.5	15.5					15.5	
Pigeonpea		12.3	12.3					12.3	
Blackgram		9.0	9.0					9.0	
Sesame		6.2	6.2					6.2	
Niger		8.2	8.2					8.2	
Groundnut		1.1	1.1					1.1	
Sugarcane		.015	.015					.015	
Wheat				9.8		9.8		9.8	
Pea				3.3		3.3		3.3	
Toria				10.3		10.3		10.3	
Linseed						5.4		5.5	
Sugarcane				0.014		0.014		0.014	

	Horticulture crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rainfed
	Mango	1.9		1.9
	Banana	0.7		0.7
	Papaya	0.5		0.5
	Jack fruit	0.4		0.4
	Litchi	0.4		0.4
	Lemon	0.5		0.5
	Aonla	0.5		0.5
	Guava	0.6		0.6
	Horticulture crops - Vegetables	Total	Irrigated	Rainfed

Cauliflower	0.5		0.5
Cabbage	0.4		0.4
Brinjal	0.6		0.6
Tomato	1.2		1.2
Potato	2.0		2.0
Bitter guord	0.4		0.4
Medicinal and Aromatic crops	Total	Irrigated	Rainfed
Lemon Grass	0.3		0.3
Khus	0.2		0.2
E.Citridora	0.4		0.4
Others	0.025		0.025
Plantation crops	Total	Irrigated	Rainfed
Eg., industrial pulpwood crops etc.			
Fodder crops	Total	Irrigated	Rainfed
Total fodder crop area			
Grazing land			
Sericulture etc			

1.8	Livestock	Male	Female	Total
	Non descriptive Cattle (local low yielding)	143422	270971	414393
	Improved cattle			
	Crossbred cattle	1258	3517	4775
	Non descriptive Buffaloes (local low yielding)	32019	55534	87553
	Descript Buffaloes			
	Goat	31148	92199	123347
	Sheep	0	0	0
	Others (Camel, Pig, Yak etc.)	1100	1283	452500
	Commercial dairy farms (Number)			144
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	5	24200	
	Backyard			

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	i) Marine (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) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		SHG		3		-	
	B. Culture						
				Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)	
	i) Brackish water (Data Source: MPEDA/ Fisheries Department)						
	ii) Fresh water (Data Source: Fisheries Department)						

1.11 Production and Productivity of major crops

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)	
Major Field crops (Crops identified based on total acreage)										
	Rice	731.1	1159					731.1	1159	
	Maize	14.6	943					14.6	943	
	Pigeonpea	12.5	1005					12.5	1005	
	Blackgram	3.14	345					3.14	345	
	Sesame	1.8	291					1.8	291	
	Niger	2.6	314					2.6	314	
	Groundnut	0.7	700					0.7	700	

Sugarcane	0.9	5450					0.9	5450	
Wheat			13.6	2491			13.6	2491	
Pea			1.8	548			1.8	548	
Toria			3.9	389			3.9	389	
Linseed			1.6	350			1.6	350	
Sugarcane			0.06	3174			0.06	3174	

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Maize	Wheat	Chickpea
	Kharif- Rainfed	4 th week of June to 2 nd week of July	4 th week of June to 2 nd week of July		
	Kharif-Irrigated	3 rd week of June to 1 st week of July			
	Rabi- Rainfed				
	Rabi-Irrigated			3 rd week of November to 4 th week of December	4 th week of October to 2 nd week November

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

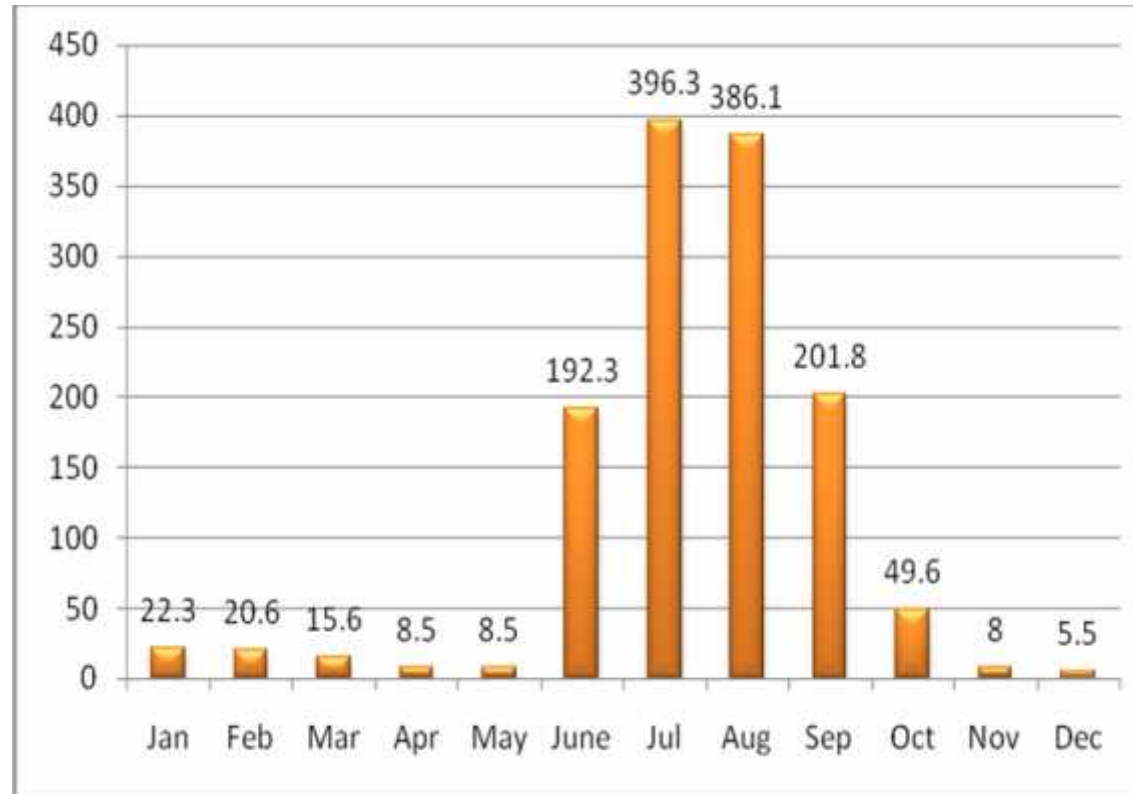
1.14	Include Digital maps of the district for	Location map of district within State as Annexure I	Enclosed: Yes
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		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes

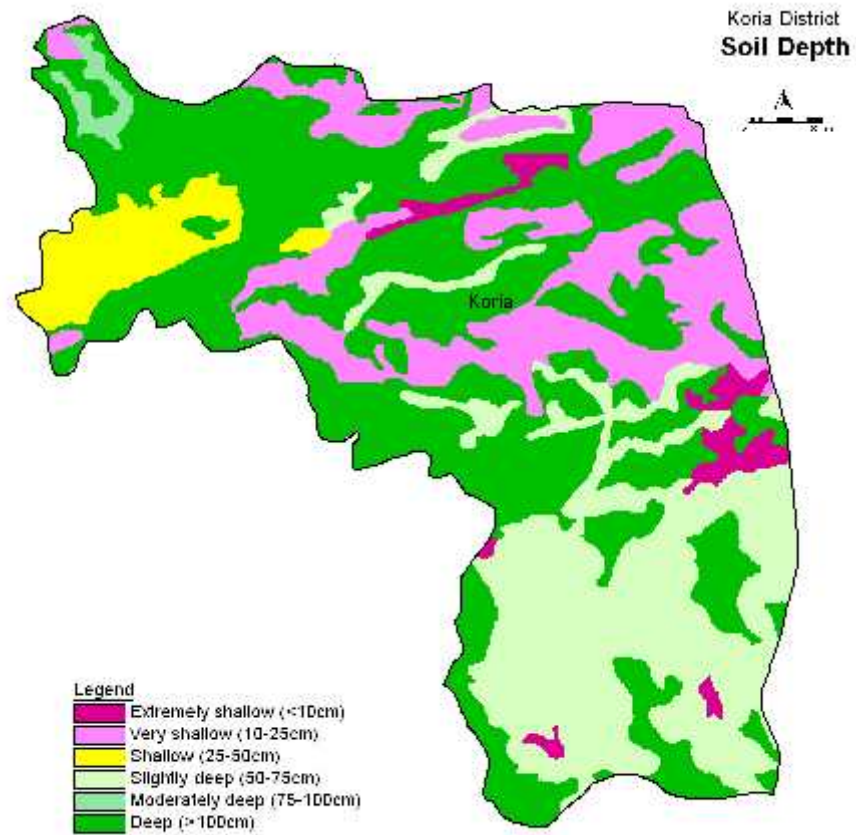
Annexure I



Annexure-II



Annexure-III



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed by 2 week June 4 th week	Upland shallow red soils	Rice- Fallow	Rice- Tulsi,Aditya, Vanprabha,Purnima Kalinga-3, Vandana	Line sowing of rice with recommended dose of fertilizer	
		Pigeonpea- Fallow	Pigeonpea: UPAS-120,TAG10,Asha, Rajivlochan,ICPL151,ICPL-87 G.Nut -SB-11, JL-24, ICGS-11, ICGS-34, ICGS-43	Proper Spacing with recommended dose of fertilizer. Line sowing of G.nut & seed Inoculate with Rhizobium culture	
		Minor millets-Fallow	Fingermillet ,KM68,VL148,km-68,vl-48, JPU28 Kutki -JK-8,BK-1 Kodo - JPUK-3,JK-41,JK-48	Seedling transplanting in Finger millets or Dry sowing 8-10 days before rains with 15-20% higher seed rate	
		Maize-Fallow	Maize- Hi sell,Proagro-6444,DHM-117,PMH-3	Line sowing & weed mangt. by Atrazin 20gm./l.water PE	
		Blackgram-Fallow varieties.- local	Blackgram : Pant u-30,Barkha,KU-2, TPU-2,TPU-4	Line sowing .and urd seed inoculate with Rhizobium culture	
		Fallow- Horsegram /Niger/Toria	Niger - IGP-76,GA-10,JNS-1, JNS-6 Horsegram- K42,Birsa kulthi-1, PK-1 Sesame -selection-5,TC-25,JT-21	Timley & line sowing of Niger & Kulthi	
	Midland	Rice-Fallow	Rice -MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona,	Apply 15-20 kg ZnSo4 before planting or sowing	
	Low land	Rice-Fallow /Rice-Linseed	Rice- Sawarna, sawarna sub-1 , Mahamaya, Danteswari, Jaldubi, Chandrahasini Linseed- R-552,kiran,shital		

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed by 4 weeks July 2 nd week	Upland shallow red soils	Rice- Fallow	Rice- Tulsi,Aditya, Vanprabha,Purnima Kalinga-3, Vandana	Line sowing of rice with recommended dose of fertilizer	1) Seed drills provide under RKVY 2) supply suitable Seed corporation/ ,Agril university
		Pigeonpea- Fallow	Pigeonpea: UPAS-120,TAG10,Asha, Rajivlochan,ICPL151,ICPL-87 G.Nut -SB-11, JL-24, ICGS-11, ICGS-34, ICGS-43	Proper Spacing with recommended dose of fertilizer. Line sowing of G.nut & seed Inoculate with Rhizobium culture	
		Minor millets-Fallow	Fingermillet ,KM68,VL148,km-68,vl-48, JPU28 Kutki -JK-8,BK-1 Kodo - JPUK-3,JK-41,JK-48	Seedling transplanting in Finger millets Or Dry sowing 8-10 days before rains with 15-20% higher seed rate	
		Maize-Fallow	Maize- Hi sell,Proagro-6444,DHM-117,PMH-3	Line sowing & weed mangt. by Atrazin 20gm./l.water PE	
		Blackgram-Fallow varieties.- local	Blackgram : Pant u-30,Barkha,KU-2, TPU-2,TPU-4	Line sowing .and urd seed inoculate with Rhizobium culture	
		Fallow- Horsegram /Niger/Toria	Niger - IGP-76,GA-10,JNS-1, JNS-6 Horsegram- K42,Birsa kulthi-1, PK-1 Sesame -selection-5,TC-25,JT-21	Timley & line sowing of Niger & Kulthi	
	Midland	Rice-Fallow Rice-Wheat	Rice -MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona,	Apply 15-20 kg ZnSo4 before planting or sowing	
Low land	Rice-Fallow Rice-Linseed	Rice- Sawarna, sawarna sub-1, Mahamaya, Danteswari, Jaldubi, Chandrahasini Linseed- R-552,kiran,shital			

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed by 6 weeks July 4 th week	Upland shallow red soils	Rice- Fallow	Sesame –Selection-5,TC-25,JT-21 Blackgram -Pant u-30,Barkha,KU-2, TPU-2,TPU-4 Niger –IGP-76,GA-10,JNS-1,JNS-6 Horsegram- K42,Birsa kulthi-1, pk-1	-	Seed drills provide under RKVY Supply suitable Seed corporation/
		Pigeonpea- Fallow			
		Minor millets-Fallow			
		Maize-Fallow			
		Blackgram-Fallow			

		varities.- local Fallow- Horsegram /Niger/Toria			,Agril university
Midland		Rice-Fallow Rice-Wheat	Rice -MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona,	Apply additional nitrogenous fertilizer.	
Low land		Rice-Fallow Rice-Linseed/ Wheat/ Pea	Rice - Sawarna, sawarna sub-1, Mahamaya, Danteswari, Jaldubi, Chandrahasini Linseed - R-552,kiran,shital	Apply 15-20 kg ZnSo4 before planting or sowing	

Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed by 8 week August 2 nd week	Upland shallow red soils	Rice-Fallow	Sesame –Selection-5,TC-25,JT-21 Niger - IGP-76,GA-10,JNS-1, JNS-6 Horsegram - K42,Birsa kulthi-1, pk-1	Line sowing with recommended dose of fertilizer	1.Seed drills provide under RKVY 2)Supply suitable Seed through Seed through seed corporation/ ,Agril university
		Pigeonpea-Fallow			
		Minor millets-Fallow			
		Maize-Fallow			
		Blackgram-Fallow			
	Fallow- Horsegram /Niger/Toriya				
	Midland	Rice-Fallow		Timely sowing with recommended dose of fertilizer	
		Rice-Wheat			
		Low land Yellow soil			
	Rice-Wheat/Pea/				
Rice-Fallow					
Rice-Linseed vr. local					

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	Upland shallow red soils	Rice-Fallow Pigeonpea-Fallow	*Thinning and gap filling the existing crops	Life saving Irrigation In situ SWC measures	Supply of inter cultural implements through

days dry spell after sowing leading to poor germination/ crop stand etc.		Minor millets-Fallow	*Re-Sowing *Sprouted seed should be sown if nursery is not available	RKVY
		Maize-Fallow		
		Blackgram-Fallow		
		Fallow- Horsegram /Niger/Toriya		
	Midland	Rice-Fallow		
		Rice-Wheat/Pea		
	Low land	Rice-Fallow		
	Rice-Chickpea/Linseed/ Lentil/Pea			

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
At vegetative stage	Upland shallow red soils	Rice-Fallow	1)Thinning, 2)post -ponment of top dressing 3) Life saving irrigation 4) Protection against diseases and pests	1)Inter cultivation (soil Mulching) 2) Conservation furrow 3) Life saving irrigation 4) Opening of conservation furrows 5) Spray of 2% urea in Rice	1)Supply of Inter cultural Implements through RKVY 2) Farm pond through IWSM programme
		Pigeonpea-Fallow			
		Minor millets-Fallow			
		Maize-Fallow			
		Blackgram-Fallow Fallow- Horsegram /Niger/ Toriya			
	Midland	Rice-Fallow			
		Rice-Wheat/Pea			
Low land	Rice-Fallow				
	Rice-Chickpea/Linseed/ Lentil/Pea				

Condition			Suggested Contingency measures		
Mid season drought (long dry spell,	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/	Upland	Rice-Fallow	Weeding and Weed mulching		

fruiting stage	shallow red soils	Pigeonpea -Fallow	Life saving irrigation Could be harvested for fodder purpose Protection against diseases and pests		
		Maize-Fallow			
		Fallow- Finger millet/ Niger/Toriya			
	Midland	Rice-Fallow			
		Rice-Wheat			
	Low land	Rice-Fallow			
Rice-Linseed/Chickpea/ Pea/Lentil					

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)	Upland shallow red soils	Rice-Fallow	1. Life saving Irrigation 2. Rainwater conserve during kharif for rabi	Make a plan for Early sowing of Niger, Horse gram	
		Pigeonpea -Fallow			
		Maize-Fallow			
	Midland	Fallow- Finger millet/ Niger/Toriya		Make plan for Utera cultivation of Linseed, Lathyrus, Lentil	
		Rice-Fallow			
	Low land	Rice-Wheat			
Rice-Linseed/Lathyrus/ Pea/Lentil					

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	Low land tube well, canal irrigated soils	Rice -Rice	Aerobic Rice	1) Alternate Furrow irrigation	Seed supply through seed corporation

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	Low land tube well, canal irrigated soils	Rice-Rice	Aerobic Rice	1)Transplanting of rice with SRI system	

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	Low land tube well, canal irrigated soils	Rice-Rice	Aerobic Rice	1) Alternate furrow Irrigation 2) Drip Irrigation	

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	Low land tube well, canal irrigated soils	Rice-Rice	Aerobic Rice	1) Alternate furrow Irrigation 2) Drip Irrigation	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater	Low land tube well, canal irrigated soils	Rice-Wheat	Rice	1) Alternate Furrow irrigation	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
recharge due to low rainfall				2)irrigate crops 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, Groundnut, Blackgram, Wheat, Rice	Provide Drainage Need based plant protection IPDM for pulses	Provide Drainage	Drain out excess water , Harvesting at Physiological maturity stage	Shift to safer place Safe storage against pest and disease
Heavy rainfall with high speed winds in a short span ²	Not applicable			
Outbreak of pests and diseases due to unseasonal rains	Not applicable			

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Potato, Tomato		*Need based plant protection, Integrated pest and disease management	*Need based plant protection IPDM	
Continuous submergence for more than 2 days ²	Not applicable			
Sea water intrusion ³	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	Not Applicable			
Cold wave	Not Applicable			
Frost				
Potato, Tomato	Protect nursery plot through polythene sheet	*Need based plant protection Integrated pest and disease management for Potato	*Need based plant protection IPDM for Potato * Irrigate the crops to protect from Frost	
Hailstorm	Not Applicable			
Cyclone	Not Applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event ^s	During the event	After the event
Drought			

Feed and fodder availability	Preservation of surplus fodder ,encourage fodder cultivation and tree plantation and also encourage supply of molasses to cattle feed plant.	Arrangement of feed and fodder from adjoining areas ,exploration of non conventional feed resources ,use of urea treated straw and feed blocks.	Promotion of fodder seed production cultivation and storage establishment of fodder blocks
Drinking water	Preserving water in the tank for drinking purpose Excavation of bore wells	Harvesting water through the existing reservoirs and exploration of ground water.	To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season
Health and disease management	Mass vaccination and De-worming	Provide shade to animals and water as much as possible .Treatment of diseased animal and proper disposal of carcasses	Treatment of diseased animal and provide vitamin and minerals supplement to regain strength and vigor
Floods			
Feed and fodder availability	Conservation of the fodder in the form of hay and silage	Feeding of feed blocks and silages	Provide treated feed and fodder to animals against moulds and fungi.
Drinking water	Regular inspection of Pons and canals for any Obstruction .	Provide drinking water in small through and plastic bucket.	Disinfection of contaminated water specially for drinking purpose.
Health and disease management	Storage of Medicines .	Treatment of injured animals	Disposal of dead animals.
Cyclone	Not applicable		
Heat wave and cold wave			
Shelter/environment management	Construction of wind breaks, poultry shed should have sufficient over hangs fixing of sprinklers on the roofs, provide thatch on the roof, decrease stocking density, decrease litter depth .Construction of wind breaks, keep curtains ready, arrange for heating devices, increase stocking density, decrease litter depth.	Provide cooling fans in shades and also sprinkle water on the roof at regular intervals. Use of wind breaks, put gunny bags on all openings of shed , use heating devices.	
Health and disease management	Routine health care	Reduce energy content and increase protein content in feed, add anti stress factors, provide cool drinking water. Increase energy content in food	

^s based on forewarning wherever available

2.5.2

Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event ^a	During the event	After the event	
Drought				
Shortage of feed ingredients	Storage of feed	Provide non conventional feed, supplement anti oxidant and anti stress		
Drinking water	Storage of water in tanks	Add vit-C and other anti stress ingredient with water		
Health and disease management	Regular vaccination	Use pellet feeding		
Floods				
Shortage of feed ingredients	Storage of feed in safe storage bins to avoid mould and fungi	Use pellet feeding		
Drinking water	Safe storage of water in tanks	Provide treated water		
Health and disease management	Regular vaccination	Vaccination and treatment of diseased one, proper litter management and addition of lime as per need.	Disposal of dead birds	
Cyclone	Not applicable			
Heat wave and cold wave				
Shelter/environment management	Construction of wind breaks, poultry shed should have sufficient over hangs fixing of sprinklers on the roofs, provide thatch on the roof, decrease stocking density, decrease litter depth .Construction of wind breaks, keep curtains	Provide cooling fans in shades and also sprinkle water on the roof at regular intervals. Use of wind breaks, put gunny bags on all openings of shed , use heating devices.		

	ready, arrange for heating devices, increase stocking density, decrease litter depth.			
Health and disease management	Routine health care	Reduce energy content and increase protein content in feed, add anti stress factors, provide cool drinking water. Increase energy content in food		

^a based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event ^a	During the event	After the event
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	1. Harvest all the large fish except the brood stock. 2. Move other fish into pens or small confined waters. 3. Provision for Rainwater harvesting 4. Deepening/Desilting of existing	1. Harvest all the fish. 2. Stock water bodies with desirable species for culture. 3. Shallow derelict waters can stocked with stunted fish seed for culture. 4. Pens of 0.2 to 0.5 ha may facilitate easy operation of culture.	1. Stocking and management of growth of stock grow out water bodies to improve
(ii) Changes in water quality	1. Monitor water quality 2. Avoid polluting materials entry into water body.	1. Monitor water quality as small water bodies have less tolerance to environmental changes leading to algal blooms and fish mortality.	1. Advent of monsoon will mitigate the water shortage and normal stocking and culture practice may be adopted.
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	1. Harvest all the large fish except the brood stock.	1. Harvest all the fish. 2. Stock ponds with desirable	1. Start breeding operation with full preparations.

	<ol style="list-style-type: none"> 2. Move other fish into pens or small confined waters with at least one meter depth. 3. Go for low stocking density. 4. Provision for Rainwater harvesting 5. Deepening/Desilting of existing water bodies. 6. Removal of debris and compaction of pond bunds. 	<ol style="list-style-type: none"> species for culture. 3. Transfer the brood stock to deep water ponds if the existing ponds cannot be filled with bore well water. 4. Postpone breeding operations till the first heavy rains or 5. Start breeding if sufficient bore well water is available. 6. Start pond preparations, like dewatering, desilting & repair of dykes. 	<ol style="list-style-type: none"> 2. Undertake nursery and rearing operations. 3. Stocking and management of grow out ponds to improve growth of stock.
(ii) Impact of salt load build up in ponds / change in water quality	<ol style="list-style-type: none"> 1. Add bore well water and if available, canal-water 	<ol style="list-style-type: none"> 1. Add bore well/ canal water if available or else harvest the stock. 2. Implement standard water conservation management practices 	<ol style="list-style-type: none"> 1. Exchange pond water with fresh surface runoff water.
2) Floods			
3. Cyclone / Tsunami	Not applicable		
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland		<ol style="list-style-type: none"> 1. Harvest the stock. 	<ol style="list-style-type: none"> 1. Stock with fingerlings with the advent of rains.
B. Aquaculture			
(i) Changes in pond environment (water quality)		<ol style="list-style-type: none"> 1. Add bore well water and if available, canal-water. 	<ol style="list-style-type: none"> 1. Exchange pond water with fresh surface runoff water
(ii) Health and Disease management		<ol style="list-style-type: none"> 1. Provide shelter (weeds) in a small area of the pond to prevent sun burn 	<ol style="list-style-type: none"> 1. Remove weeds. 2. Liming or bleaching powder need to be added.

^a based on forewarning wherever available