State: CHHATTISGARH

Agriculture Contingency Plan for District: Surguja

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)		
	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 10' N	83^0 15' E	623m
	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	Ambikapur -Surguja		
	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(C.G.)		

1.2	**Rainfall**	**Normal RF(mm)**	**Normal Onset (specify week and month)**	**Normal Cessation (specify week and month)**
	SW monsoon (June-Sep)	1178	2nd week of June	2nd Week of October
	NE Monsoon(Oct-Dec)	62.5	3rd week of October	
	Winter (Jan- March)	39.5		
	Summer (Apr-May)	33.5		
	Annual	1314		

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	1034.3	620.6	203.1	90.08	183.8	50.5	-	-	55.9	34.2

	ha)										

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)**	**Percent (%) of total**
	1. E		
	2.		
	3.		

* 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	508.8	121.9
	Area sown more than once	111.8	
	Gross cropped area	620.6	

Irrigation	**Area ('000 ha)**	Percent(%)	
Net irrigated area	26.1	5.14	
Gross irrigated area	63.3	10.21	
Rainfed area	508.8	84.65	
Sources of irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
Canals	-	8.1	
Tanks	-	12.2	
Open wells	-	8.4	
Bore wells	-	10.9	
Lift irrigation schemes	-	-	
Micro-irrigation	-	-	
Other sources (please specify)	-	23.5	
Total irrigated area	-	508.8	9%
Pump sets	-	-	
No. Of tractors	-	-	
Groundwater availability and use* (data source:	No. Of blocks/ tehsils	(%) area	Quality of water (specify the problem such as high levels of

state/central ground water department /board)			arsenic, fluoride, saline etc)
Over exploited	0	<70-100	
Critical	0	<70-100	
Semi- critical	0	<70-100	
Safe	0	<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***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice		306.6	306.6					306.6
	Maize		43.6	43.6					43.6
	Pigeonpea		28.8	28.8					28.8
	Blackgram		23.2	23.2					23.2
	Sesame		5.3	5.3					5.3
	Niger		19.3	19.3					19.3
	Groundnut		13.8	13.8					13.8
	Sugarcane	3.1	3.1	6.2					6.2
	Wheat				33.3		33.3		33.3
	Pea				8.6		8.6		8.6
	Toria				30.8		30.8		30.8
	Llinseed					11.4	11.4		11.4
	Sugarcane				2.5		2.5		2.5

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	9.0		9.0
	Banana	1.5		1.5
	Papaya	1.6		1.6

	Jack fruit	0.9		0.9
	Litchi	2.4		2.4
	Pear	0.6		0.6
	Others	0.8		0.8
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Cauliflower	1.6		1.6
	Cabbage	1.4		1.4
	Brinjal	3.4		3.4
	Tomato	4.1		4.1
	Potato	12.7		12.7
	Bitter guord	1.2		1.2
	Medicinal and Aromatic crops	Total	**Irrigated**	**Rainfed**
	Lemon Grass	0.1		0.1
	E.Citridora	0.6		0.6
	Others	0.04		0.04
	Plantation crops	**Total**	**Irrigated**	**Rainfed**
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	Total fodder crop area			
	Grazing land			
	Sericulture etc			

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	623.3	956.6	719.0
	Improved cattle			
	Crossbred cattle	5.3	13.07	18.4
	Non descriptive Buffaloes (local low yielding)	217.4		220.04
	Descript Buffaloes			
	Goat	148.9	404.02	553.0
	Sheep	2.6	4.9	7.5
	Others (Camel, Pig, Yak etc.)	76	33	.10
	Commercial dairy farms (Number)	-	-	.1

1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**
	Commercial	111	148.5
	Backyard	0	0

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**	
	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	148.1	1605					148.1	1605	
	Maize	20.9	1520					20.9	1520	
	Pigeonpea	8.1	761					8.1	761	

	Blackgram	4.5	603					4.5	603	
	Sesame	0.5	363					0.5	363	
	Niger	3.0	318					3.0	318	
	Groundnut	6.3	1313					6.3	1313	
	Sugarcane	3.2	3448					3.2	3448	
	Wheat			16.5	1442			16.5	1442	
	Pea			1.7	592			1.7	592	
	Toria			6.5	652			6.5	652	
	Linseed			1.5	433			1.5	433	
	Sugarcane			2.9	3490			2.9	3490	

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Maize**	**Ground nut**	**Wheat**	**Sugarcane**
	Kharif- Rainfed	4th week of June to 2nd week of July	4th week of June to 2nd week of July	4th week of June to 2nd week of July		
	Kharif-Irrigated	3rd week of June to 1st week of July				
	Rabi- Rainfed					-
	Rabi-Irrigated				2nd week of November to 1st week of January	4th week of February to 2nd week of April

1.13	**What is the major contingency the district is prone to?** (Tick mark)	**Regular**	**Occasional**	**None**
	Drought		√	
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave			√

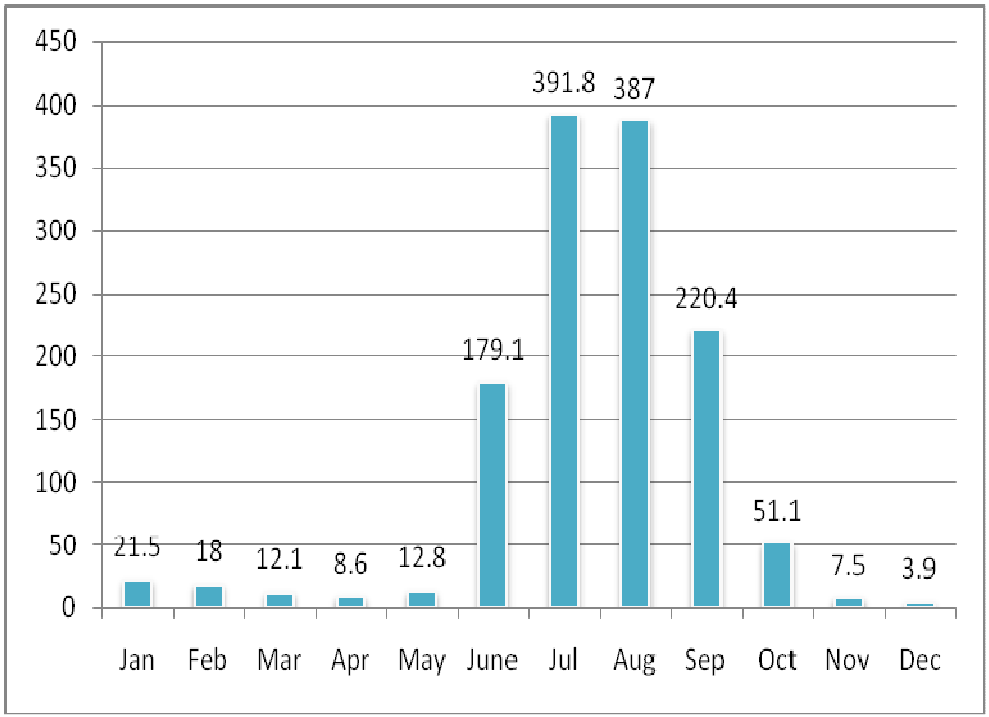
	Cold wave			√
	Frost		√	
	Sea water intrusion			√
	Pests and disease outbreak (specify)			√

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

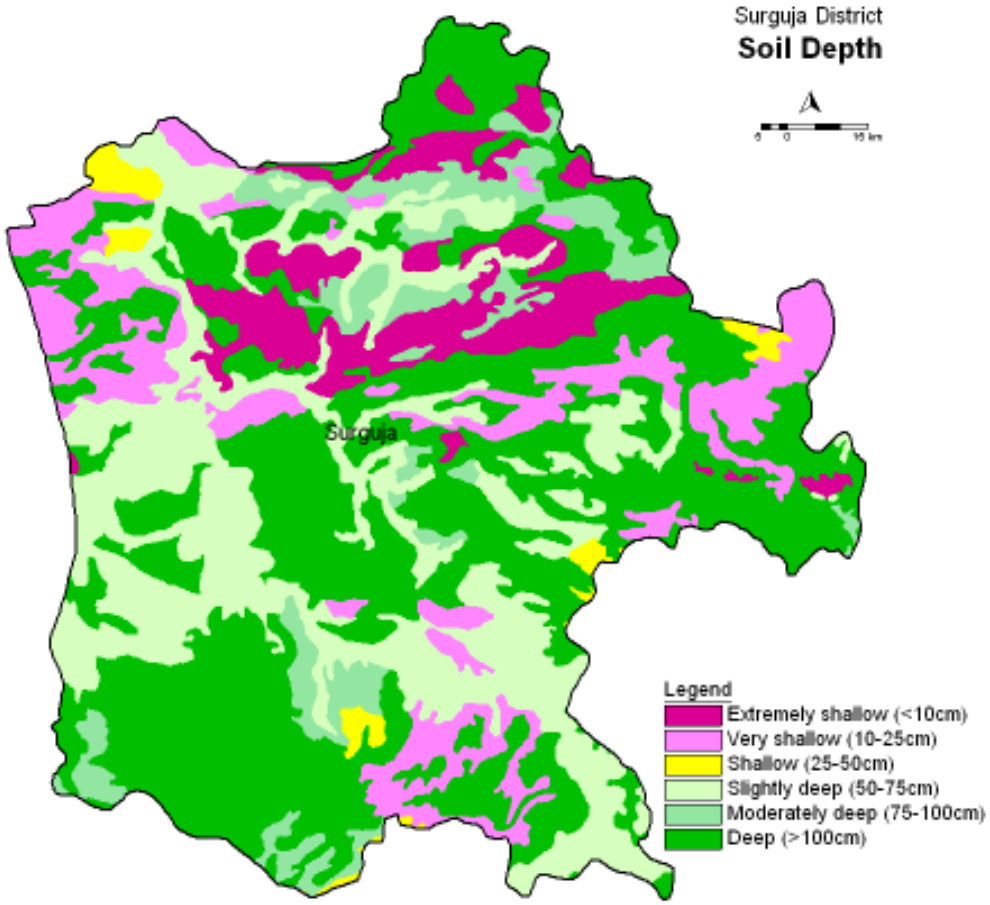
Annexure I


Koria
Sarguja
Jashpurnagar
Korba
Bilaspur
Kabirdham
Raigarh
Janjgir
Raipur
Durg
Rajnandgaon
Mahasamund
Dhamtari
Kanker
Bastar
Dantewada

Annexure II


450
400
350
300
250
200
150
100
50
0
21.5
18
12.1
8.6
12.8
179.1
391.8
387
220.4
51.1
7.5
3.9
Jan
Feb
Mar
Apr
May
June
Jul
Aug
Sep
Oct
Nov
Dec

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 4th week	Upland shallow red soils	Rice-Fallow	**Rice-** Tulsi,Vandana, Aditya,Kalinga-3,Vanprabha	Line sowing with recommended dose of fertilizer	
		Pigeonpea-Fallow	**Pigeonpea -**UPAS-120,TAG-10,Asha, Rajivlochan, ICPL-151, ICPL-87 **Urd-** JU-2, JU-3, PDU-1TAU-2, TU-94-2	Proper Spacing with recommended dose of Fertiliser & Seed Inoculation with Rhizobium culture	
		Maize-Fallow	**Maize-** Hi sell,Proagro-6444 ,BIO-9681,DHM117,PMH-3,PRO-4640,PIO30-R26	Line sowing & weed management. by Atrazin @ 2 gm./litre water at (PE)	
		Groundnut-Fallow	**Groundnut -**SB-11, JL-24, ICGS-11, ICGS-34, ICGS-43 **Sesame**-Selection-5,TC-25,JT-21	Line sowing & seed Inoculation with Rhizobium culture	
		Fallow-Horsegram/Niger/ Toria	**Niger -**IGP-76,GA-10,JNS-1,JNS-6 **Horsegram-** K42,Birsa kulthi-1, pk-1	Timely sowing of Niger & Finger millet	
	Midland	Rice-Fallow Rice-Wheat/Pea	**Rice**-MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona	Use 15-20 days old seedling for transplanting Apply 15-20 kg ZnSo4 before planting or sowing Apply recommended dose of Fertilizer	
	Low land	Rice-Fallow Rice-Linseed	**Rice**-Sawarna,Sawarna ,Jaldubi Mahamaya,Danteswari ,Bambleswari **Linseed-** R552,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 week July 2nd week	Upland shallow red soils	Rice-Fallow	**Rice-** Tulsi,Vandana, Aditya,Kalinga-3,Vanprabha	Line sowing with recommended dose of fertilizer	1).Seed drills is being provide under RKVY 2) Rhizobium culture Supply through RKVY 3)Supply suitable Seed through Seed through seed corporation/ ,Agril university
		Pigeonpea-Fallow	**Pigeonpea -**UPAS-120,TAG-10,Asha, Rajivlochan,ICPL-151,ICPL-87 **Urd-** JU-2,JU-3,PDU-1TAU-2,TU-94-2	Proper Spacing with recommended dose of Fertiliser & Seed Inoculation with Rhizobium culture	
		Maize-Fallow	**Maize-** Hi sell,Proagro-6444 ,BIO-9681,DHM117,PMH-3,PRO-4640,PIO30-R26	Line sowing & weed management. by Atrazin @ 2 gm./lit water at (PE)	
		Groundnut-Fallow	**Groundnut -**SB-11, JL-24, ICGS-11, ICGS-34, ICGS-43 **Sesame**-Selection-5,TC-25,JT-21	Line sowing & seed Inoculation with Rhizobium culture	
		Fallow-Horsegram/Niger/ Toria	**Niger -**IGP-76,GA-10,JNS-1,JNS-6 **Horsegram-** K42,Birsa kulthi-1, pk-1	Timley sowing of Niger & Finger millet	
	Midland	Rice-Fallow Rice-Wheat/Pea	**Rice**-MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona	Use 15-20 days old seedling for transplanting Apply 15-20 kg ZnSo4 before planting or sowing Apply recommended dose of Fertilizer	
	Low land	Rice-Fallow Rice-Linseed	**Rice**-Sawarna,Sawarna ,Jaldubi Mahamaya,Danteswari ,Bambleswari **Linseed-** R552,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 week July 4th week	Upland shallow red soils	Rice-Fallow Pigeonpea-Fallow Maize-Fallow Groundnut-Fallow	**Pegionpea-**UPAS120,TAG10,Asha, Rajivlochan,ICPL151,ICPL-87 **Urd-** JU-2,JU-3,PDU-1TAU-2,TU-94-2 **Moong-**Pusa Vishal,BM-4,HUN-12,Pragya,Pairi Moong	Proper Spacing with recommended dose of fertilizer & seed Inoculation with Rhizobium culture	1).Seed drills is being provide under RKVY 2) Rhizobium culture Supply through RKVY 3)Supply suitable Seed through Seed through seed corporation/ ,Agril university
		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	Timely sowing of Niger & Finger millet	
	Midland	Rice-Fallow Rice-Wheat/Pea	**Rice**-Sawarna,Sawarna ,Jaldubi Mahamaya,Danteswari ,Bambleswari **Linseed-** R552,kiran,shital	Direct Seeding of Sprouted rice seed under puddled condition Grow short and medium duration variety	
	Low land	Rice-Fallow Rice-Linseed			

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 2nd week	Upland shallow red soils	Rice-Fallow Pigeonpea-Fallow Maize-Fallow Groundnut-Fallow Var.- local / Improved Fallow- Horsegram /Niger /Toriya	**Niger -** IGP-76,GA-10,JNS-1, JNS-6 **Horse Gram-** K42,Birsa kulthi-1, pk-1 **Sesame**-selection-5,TC-25,JT-21 **Fingermillet,-**KM68,VL148,km-68,vl-48		1).Seed provide by drills under RKVY 2) Rhizobium culture Supply through RKVY 3)supply suitable Seed through Seed through seed corporation/ ,Agril university
	Midland	Rice-Fallow Rice-Wheat/Pea	**Rice-**MTU-1010,PA-6444,PHB-71,KRH-1,Indira sona	Apply additional nitrogenous fertilizer Apply 15-20 kg ZnSo4 before planting or sowing	
	Low land	Rice-Fallow Rice-Linseed	**Rice**-Sawarna,sawerna sub-1 sapada,Mahamaya,Danteswari swarna,		

Early season drought (Normal onset)	Major Farming situation	Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measues	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc	Upland shallow red soils	Rice-Fallow	Thinning and gap filling the existing crops *Re-Sowing *Sprouted seed should be sown if nursery is not available	Life saving Irrigation In situ SWC measures	Supply of inter cultural implements through RKVY
		Pigeonpea-Fallow			
		Maize-Fallow			
		Groundnut-Fallow Var.- local / Improved			
		Fallow- Horsegram /Niger /Toria			
	Midland	Rice-Fallow Rice-Wheat/Pea			
	Low land	Rice-Fallow Rice-Linseed			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Upland shallow red soils	Rice-Fallow	Thinning, Post -ponment of top dressing, Life saving irrigation Protection against diseases and pests	1.Inter cultivation (Soil Mulching) 2.Conservation furrow 2. Life saving irrigation 3. Opening of conservation furrows 4. Spray of 2% urea in paddy.	1)Supply of Inter cultural Implements through RKVY 2) Farm pond through IWSM programme 3) Seed supply through seed corporation
		Pigeonpea -Fallow			
		Maize-Fallow			
		Fallow- Horse gram/Niger/ Toria			
		Groundnut -Fallow			
	Midland	Rice-Fallow	Conserve water in crop field, Life saving irrigation		
	Low land	Rice-Fallow			
		Rice-Linseed/Lathyrus/ Pea/Lentil			

Condition			Suggested Contingency measures		
Mid season drought (long dry spell,	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
At flowering/ fruiting stage	Upland shallow red soils	Rice-Fallow	1) Weeding and Weed mulching 2) Life saving irrigation 3) Could be harvested for fodder purpose 4) Protection against diseases and pests	1. Life saving Irrigation 2. Rainwater conservation during kharif season	1) Farm pond through IWSM programme
		Pigeonpea -Fallow			
		Maize-Fallow			
		Fallow- Horse gram/Niger/ Toria			
		Groundnut -Fallow			
	Midland	Rice-Fallow			
	Low land	Rice-Fallow			
		Rice-Linseed/Lathyrus/ Pea/Lentil			

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**
	Upland shallow red soils	Rice-Fallow	Life saving Irrigation Rainwater conserve during kharif for rabi	1)Make a plan for Early sowing of Ramtil , Kulthi(Horse gram)	
		Pigeonpea -Fallow			
		Maize-Fallow			
		Fallow- Horse gram/Niger/ Toria			
		Groundnut -Fallow			
	Midland	Rice-Fallow		1)Make plan for Utera cultivation of Linseed,Lathyrus,Lentil	
		Rice-Wheat			
	Low land	Rice-Linseed/Lathyrus/ Pea/Lentil			

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Low land tube well, canal irrigated soils	Rice -Rice	**Aerobic Rice**	1) Alternate Furrow irrigation	Seed supply through seed corporation
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	
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	
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	
Insufficient groundwater recharge due to low rainfall	Low land tube well, canal irrigated soils	Rice-Wheat	**Wheat**,- GW-273,GW173,DL-788-2,C-306 **Mustard**-Varun,Pusa bold, varun,vardan,Krishna **Gram**-JG-74,JG-315,vaibhav	1) Alternate Furrow irrigation 2)irrigate crops at critical stages	

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
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[o]			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days[2]	Not Applicable			
Sea water intrusion[3]				

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

Extreme event type	Suggested contingency measurer			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat wave[p]	Not Applicable			
Cold wave[q]	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 carcases	Treatment of diseased animal and provide vitamin and minerals supplement to regain strength and vigor
Floods	Not Applicable		
Cyclone	Not Applicable		
Heat wave and cold wave	Not Applicable		

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event	**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	Not Applicable			
Cyclone	Not Applicable			
Heat wave and cold wave	Not Applicable			

[a]**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 ofgrowth 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. 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.	1. Harvest all the fish. 2. Stock ponds with desirable 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.	1. Start breeding operation with full preparations. 2. Undertake nursery and rearing operations. 3. Stocking and management of grow out ponds to improve growth of stock.

		6. Start pond preparations, like deweeding, desilting & repair of dykes.	
(ii) Impact of salt load build up in ponds / change in water quality	1. Add bore well water and if available, canal-water	1. Add bore well/ canal water if available or else harvest the stock. 2. Implement standard water conservation management practices	1. Exchange pond water with freshsurface runoff water.
2) Floods	Not Applicable		
3. Cyclone / Tsunami	Not Applicable		
4. Heat wave and cold wave	Not Applicable		

[a] based on forewarning wherever available