

State: ORISSA

Agriculture Contingency Plan for District: BOUDH

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Gujrat hills, Dandakaranya and Eastern Ghats hot moist sub-humid transitional eco-subregion (12.1).		
	Agro-Climatic Zone (Planning Commission)	East Coast Plains And Hills Region (XI)		
	Agro Climatic Zone (NARP)	North Eastern Ghat Zone (OR-5)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Rayagada, Kandhamal and Baudh.		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		20 ⁰ 49' 56.20" N	84 ⁰ 19 46.97" E	91 m
	Name and address of the concerned RRTTS	RRTTS, Chiplima At:- Satupali ,Po:- Chiplima , Dist:- Sambalpur		
	Mention the KVK located in the district with address	KVK Boudh At:- Paljhar ,Po:Salunki, Dist:- Boudh, PIN- 762026		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	AMFU,RRTTS, Chiplima At:- Satupali , Po:- Chiplima , Dist:- Sambalpur			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep)	1385.9	54	3 rd week of June	3 rd week of October
	NE Monsoon(Oct-Dec)	116	6	2 rd week of October	2 nd week November

	Winter (Jan- Feb)	66.2	4		
	Summer (Mar-May)	54.9	4		
	Annual	1623	68		

1.3	Land use pattern of the district (2008-09)	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)	310	89	128	21	17	20	19	12	3	4

Source; Orissa Agriculture Statistic, 2008-09

1.4	Major Soils (common names like red sandy loam deep soils (etc.,))*	Area ('000 ha)	Percent (%) of total
	Red & black soil (light, Loamy)	164.3	53
	Black soil (clayey, heavy)	96.1	31
	Red soil (light, Sandy)	49.6	16

(Source: SREP, Boudh)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	86	162
	Area sown more than once	53	
	Gross cropped area	139	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	40.96(K) and 12.69(R)		
	Gross irrigated area	53.51(K) and 13.55(R)		
	Rain fed area	45.04		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals(Major & Medium)	2	31.5	47
	Minor project	52	12.8	19.1
	Tanks	43	1.1	1.7
	Open wells	3892	3.6	5.4
	Bore wells	5	0.01	0.01
	Lift irrigation schemes	192	12.1	17.9
	Micro-irrigation	-	-	-
	Other sources (WHS)	41	5.9	8.7
	Total Irrigated Area	-	67.1	-
	Pump sets	1050	-	-
	No. of Tractors	15	-	-
	Source : District Agriculture Office, Boudh & Directorate of Agriculture & Food Production, Bhubaneswar, Orissa (2008-09)			
	Groundwater availability and use* (Data source: District Agriculture Office, Boudh	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	3	100	-
	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) (Specify year eg. 2008-09)

1.7	Major field crops cultivated	Area ('000 ha)									
		Kharif			Rabi			Summer			Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	
Paddy	39.2	29.8	69.0	-	-	-	1.9	-	1.9	70.9	
Moong	-	3.6	3.6	0.3	8.6	9.0	-	-	-	12.6	
Biri	-	3.6	3.6	0.2	1.7	1.8	-	-	-	5.5	
Arhar	-	4.7	4.7	-	-	-	-	-	-	4.7	
Sesamum	-	2.9	2.9	0.1	1.7	1.8	-	-	-	4.7	

Source-Orissa Agriculture Statistic, 2008-09

Horticulture crops - Fruits	Area ('000 ha)
	Total
Mango	1.6
Guava	0.2
Citrus	0.3
Sapota	0.01
Banana	0.3
Horticulture crops - Vegetables	Total
Onion	0.4
Potato	0.1

Chilli	1.1
Sweet potato	0.4
Vegetables	14.4
Medicinal and Aromatic crops	Total
Garlic	0.2
Turmeric	0.1
Ginger	0.1
Coriander	0.6
Plantation crops	Total
Coconut	0.2
Bamboo	0.05
Teak, Eucalyptus, sisoo	0.1
Fodder crops	Total
Sorghum (MP-Chari)	0.0015
Berseem	0.0015
NB-21	0.0005
Para	0.0005
Total fodder crop area	0.004
Grazing land	16.2
Sericulture etc	

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)			
	Non descriptive Cattle (local low yielding)	119.1	105.0	224.1			
	Improved cattle	5.2	5.9	11.0			
	Crossbred cattle						
	Non descriptive Buffaloes (local low yielding)	18.6	20.2	38.8			
	Descript Buffaloes	0.3	0.3	0.6			
	Goat	37.8	73.9	111.7			
	Sheep	27.4	42.3	69.7			
	Others (Pig,)	0.5	0.7	1.2			
	Commercial dairy farms (Number)	-	-	-			
1.9	Poultry	No. of farms	Total No. of birds ('000)				
	Commercial	-	9.3				
	Backyard	-	166.6				
	Data source : District Veterinary Office, Boudh						
1.10	Fisheries						
	A. Capture						
	i) Marine	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: Office of ADF, Boudh)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
		513		26		1718	
	B. Culture						
				Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)	

	i) Brackish water	-	-	-
	ii) Fresh water (Data Source: Fisheries Department)	1020	2	2.04
	Others			

1.11 Production and Productivity of major crops (2008-09)

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 to be identified based on total acreage)										
	Rice	89.8	1300	-	-	3.3	1738	93.1	1312	-
	Green gram	1.7	465	4.7	522	-	-	6.3	506	-
	Black gram	1.7	464	0.9	508	-	-	2.6	479	-
	Arhar	3.2	683	-	-	-	-	3.2	683	-
	Sesamum	1.2	412	0.8	456	-	-	2.0	429	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Onion	-	-	3.7	9974	-	-	3.7	9974	-
	Potato	-	-	0.6	6926	-	-	0.6	6926	-
	Chilli	0.3	733	0.4	817			0.8	781	
	Sweet potato	3.1	8500	0.12	4000	-	-	3.1	8154	-
	Vegetables	86.6	11433	108.0	157.2	-	-	194.6	13476	-

(Source: Orissa Agril .Statistics, 2008-09)

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Arhar	Green gram	Black gram	Sesamum
	Khariif- Rainfed	3 rd week of June to 4 th week of July	3 rd week of June to 2 nd week of August	3 rd week of June to 2 nd week of August	3 rd week of June to 2 nd week of August	3 rd week of July to 4 th week of August
	Khariif-Irrigated	1 st week of July to 1 st week of August	-	-	-	-
	Rabi- Rainfed	-	-	2 nd week of November to 1 st week of December	2 nd week of November to 1 st week of December	-
	Rabi-Irrigated	1 st week January to 2 nd week of February.	-	4 th week of December to 2 nd week of January.	4 th week of December to 2 nd week of January.	3 rd week of January to 2 nd week of February

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 (Aphids, Thrips & YMV infection in Pulses, Stem borer, Swarming caterpillar & incidence of Blast, Bacterial. Leaf blight in paddy, Wilt in Tomato . YMV in Cucurbits, fruit & shoot borer & fruit rot in brinjal.	√		

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

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 (July 1 st week)	Plain land irrigated- Upland	Sole crops <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Varietal substitution with drought tolerant rice variety like Khandagiri, JHU, Hira, Pathara, • Sesamum: Uma, Usha, Prachi, Nirmala • Arhar: ICPL-85063, UPAS-120 • Greengram: OUM-11-5, PDM-11, PDM-54 • Blackgram : Prasad, Ujala • Groundnut : Smruti, Devi, TAG-24 • Brinjal: Utkal Anushree, Utkal Tarini, Blue star • Cow Pea : Utkal Manika • Okra : Arka Anamika, Utkal Gourav • Intercropping of Arhar + G.nut (2:6) Maize + Cowpea (2:2) Arhar + G gram/ B.Gram (2:3) 	<ul style="list-style-type: none"> • In-situ Rain water conservation through summer ploughing & inter cultural operation. • Bunding of unbunded upland • Closure row & plant spacing • Application of full dose of P & K and 20% of N fertilizer along with FYM for moisture conservation • Sowing of seeds across the slope 	<ul style="list-style-type: none"> • Supply of seeds through OSSC, ATMA, NFSM • Supply of agricultural implements through OAIC, RKVY. • Rearing of Goatery & poultry for livelihood (Through vetenary department) • Mushroom cultivation & Vermicomposting through KVK, ATMA and Horticulture Department • Composite Pisciculture and Integrated farming system through NREGS.

	Plain land irrigated – Medium land	Paddy-Greengram/Blackgram	<ul style="list-style-type: none"> • Choosing short duration to medium duration paddy variety like Lalata, Manaswini, Konark, Jogesh, Surendra, MTU-1001, Naveen • Greengram: PDM-11, PDM-54, OUM-11-5, TARM-1, Sujata • Blackgram: Ujala, Prasad, PU-19, PU-30, Sarala 	<ul style="list-style-type: none"> • Application of full dose of P & K and 20% of N fertilizer • In-situ Rain water conservation • Weeding and interculture • Life saving irrigation 	<ul style="list-style-type: none"> • Supply of seeds through OSSC, ATMA, NFSM • Supply of agricultural implements through OAIC, RKVY.
	Plain land Irrigated- Low land	Paddy	<ul style="list-style-type: none"> • Swarna, Pratikshya, Ranidhan 	<ul style="list-style-type: none"> • Application of full dose of P & K and 20% of N fertilizer • In-situ Rain water conservation 	<ul style="list-style-type: none"> • Supply of seeds through OSSC, ATMA, NFSM • Supply of agricultural implements through OAIC, RKVY. • Feed and disease management by Fishery department
		Paddy-Greengram/Black gram	<ul style="list-style-type: none"> • Medium – late duration paddy variety : Pratikshya, Ranidhan, Pooja, Swarna • Greengram variety : PDM-11, PDM-54, OUM-11-5, TARM-1, Sujata • Blackgram variety : Ujala, Prasad, PU-19, PU-30, Sarala 		
		Paddy-Lathyrus	<ul style="list-style-type: none"> • Medium – late duration paddy variety : Pratikshya, Ranidhan, Pooja, Swarna 		

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 4 weeks (July 3 rd week)	Plain land irrigated-upland	Sole crops <ul style="list-style-type: none"> • Paddy 	<ul style="list-style-type: none"> • Varietal substitution with draught tolerant rice variety like Jogesh, Sidhanta, Khandagiri, Hira, Pathara, • Sesamum : Uma, Usha, Prachi, 	<ul style="list-style-type: none"> • Insitu- water conservation measures through intercultural operations • Bunding of unbunded upland 	<ul style="list-style-type: none"> • Supply of seeds through OSSC, ATMA, NFSM • Supply of

		<ul style="list-style-type: none"> • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. <ul style="list-style-type: none"> - Brinjal - Okra 	<p>Nirmala</p> <ul style="list-style-type: none"> • Arhar : ICPL-85063,UPAS-120 • Greengram : OUM-11-5,PDM-11 • Blackgram : Prasad, Ujala • Groundnut : Smruti, Devi, TAG-24 • Brinjal : Utkal Anushree,Utkal tarini, Blue star • Cow pea : Utkal Manikaa • Okra : Arka anamika, Utkal gourav • Intercropping of Arhar + G.nut (2:6) Maize + Cowpea (2:2) Arhar + G gram/ B.Gram (2:3) 	<ul style="list-style-type: none"> • Growing of short duration and low water requiring crops like Greengram, Blackgram, Sesamum, Cowpea and vegetables 	<p>agricultural implements through OAIC, RKVY.</p>
	Plain land irrigated and medium land	<ul style="list-style-type: none"> • Paddy <p>Paddy-Greengram/Blackgram</p>	<ul style="list-style-type: none"> • Choosing medium duration paddy variety like Lalata, Manoswani, Konark, Jogesh, Surendra, MTU-1001, Naveen • Greengram:PDM-11,PDM-54, OUM-11-5,TARM-1, Sujata • Blackgram var. Ujala, Prasad,PU-19, PU-30, Sarala 	<ul style="list-style-type: none"> • Application of organic manure for moisture conservation • Use of tractor and power tiller for quick puddling • Growing of community nursery • Transplanting by transplanter • Cultivation of paddy through SRI method 	<ul style="list-style-type: none"> • Seed supply through OSSC • Supply of tractor, power tiller and Transplanter through RKVY
	(3) Plain land irrigated- Low land	<p>Paddy</p> <p>Paddy-Greengram/Black gram</p> <p>Paddy-Lathyrus</p> <p>Composite Pisciculture in the</p>	<ul style="list-style-type: none"> • Swarna, Pratikshya. Ranidhan, Pooja, • Medium – late duration paddy variety , Pratikshya, Ranidhan, Pooja, Swarna • Greengram variety : PDM-11,PDM-54, OUM-11-5,TARM-1, Sujata • Blackgram variety : Ujala, Prasad,PU-19, PU-30, sarala • Medium – late duration paddy variety : Pratikshya, Ranidhan, Pooja, Swarna • Indian major carps-Rohu, Mrigal, Catla, Silver carp and Grass carp 	<ul style="list-style-type: none"> • Selection of medium late duration paddy variety like Pratikshya, Ranidhan, Pooja, Swarna • Application of organic manure for moisture conservation • Use of tractor and power tiller for quick puddling • Grow community nursery • Transplanting by transplanter • Cultivation of paddy through SRI method 	<ul style="list-style-type: none"> • Seed supply through OSSC • Supply of tractor, power tiller and transplanter through RKVY

		farm fond			
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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 (August 1 st week)	Plain land irrigated- upland	Sole crops <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Growing of non-paddy crops like sesamum, blackgram, greengram, cowpea , okra, • Sesamum: Uma, Usha, Prachi, Bimala • Greengram: PDM-11,PDM-54, OUM-11-5,TARM-1, Sujata • Blackgram : Ujala, Prasad, PU-19, PU-30, Sarala • Cowpea: Utkal Manika • Okra: Utkal Gourav, Arka Anamika 	<ul style="list-style-type: none"> • Apply full P₂O₅ , K & 20 % of N₂ as basal along with FYM • Early hoeing and weeding • Application of weedicide pendimethaline @ 2.5 l/ha • Spraying of 2 % KCl and 1% Boron in blackgram • Foliar application of 2% urea at pre-flowering stage I Greengram • Spraying of 1% urea in vegetable crops • Spraying of Rogor @1l/ha to control aphids and Mealybugs 	<ul style="list-style-type: none"> • Supply of herbicide and insecticide through NFSM
		Plain land irrigated and midland	Paddy	<ul style="list-style-type: none"> • Cultivation of short-medium duration paddy variety Khandagiri, Lalata, Manaswini • Vegetables like Okra: Utkal Gourav, Arka Anamika • Brinjal variety like Utkal Anushree,Utkal Tarini, Blue Star 	<ul style="list-style-type: none"> • Close drainage hole and checking of seepage loss in direct sown paddy • Puddling through tractor and power tiller for quick transplanting 	
			Paddy-Greengram/Black gram			
	Plain land irrigated and lowland	Paddy	<ul style="list-style-type: none"> • Growing medium-late duration paddy variety like Lalata, Pratikshya, Ranidhan, Pooja, Swarna 	<ul style="list-style-type: none"> • Use of tractor and Power tiller for quick land preparation • Need based pesticide application against stem borer and blast • Closer planting of 4-5 	<ul style="list-style-type: none"> • Supply of pesticide through NFSM 	
		Paddy-Greengram/Blackgram				

		Paddy-Lathyrus		seedlings per hill <ul style="list-style-type: none"> • Apply full P,K and 50% N at the time of transplanting • Close the drainage hole and check the seepage loss 	
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Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks (Aug 3 rd week)	Plain land irrigated-upland	Sole crops <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Growing of non-paddy crops like Sesamum, Blackgram, Greengram, Cowpea , Okra, • Sesamum : Uma, Usha, Prachi, Bimala • Greengram: PDM-11,PDM-54, OUM-11-5,TARM-1, Sujata • Blackgram: Ujala, Prasad,PU-19, PU-30, Sarala • Cowpea: Utkal Manik • Okra: Utkal Gourav, Arka Anamika, 	<ul style="list-style-type: none"> • Apply full P₂O₅ , K₂ O & 20 % of N₂ as basal along with FYM • Early hoeing and weeding • Application of Weedicide Pendimethalin @ 2.5 l/ha • Apply life saving irrigation when needed • Spraying of 2 % KCl and 1% Boron in Blackgram • Foliar application of 2% urea at pre-flowering stage of Greengram • Spraying of 1% urea in vegetable crops • Spraying of Rogor @1 lit /ha to control aphids and Mealybugs 	<ul style="list-style-type: none"> • Supply of herbicide and insecticide through NFSM
	Plain land irrigated and midland	<ul style="list-style-type: none"> • Paddy Paddy-Greengram/Black gram	<ul style="list-style-type: none"> • Growing of short duration paddy variety like Khandagiri, Yogesh, Vandana, 	<ul style="list-style-type: none"> • Close drainage hole and checking of seepage loss in direct sown paddy • Puddling through tractor and power tiller for quick transplanting 	
	Plain land irrigated and lowland	Paddy Paddy-Greengram/	<ul style="list-style-type: none"> • Selection of medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 	<ul style="list-style-type: none"> • Use of tractor and Power tiller for quick land preparation • Need based pesticide application against stem borer and blast 	

		Black gram		<ul style="list-style-type: none"> • Closer planting of 4-5 seedlings per hill • Apply full P,K and 50% N at the time of transplanting • Close the drainage hole and check the seepage loss 	
		Paddy-Lathyrus			
		Composite Pisciculture in the farm pond			

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 sowing leading to poor germination/crop stand etc.	Plain land irrigated-upland	Sole crops <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Use short duration vars. Of sole crops • Re-sowing of crop if there > 50 % mortality of plant • Gap filling is done if there is less than 50% of plant mortality • Cultivation of vegetable like cowpea, guar, okra, brinjal • Intercropping with arrowroot, yam in fruit orchard • Cultivation of Ragi, Biri, Moong, Sesamum, Castor 	<ul style="list-style-type: none"> • Hoeing ,weeding, earthing up at 20 DAS for moisture conservation • Conserve rain water • Application of lime and FYM in acid soil as per recommended dose. 	
	Plain land irrigated and midland	<ul style="list-style-type: none"> • Paddy 	<ul style="list-style-type: none"> • Re-sowing of rice by punji method if plant population is less than 50% and cover it with FYM • Higher seed rate 100- 120 kg / ha • Sprouted seeds may be directly seeded or fresh seedling transplanted • Weeding & khelua operation is carried out if there < 50 % mortality of plant 	<ul style="list-style-type: none"> • Cover sown seed with a mixture of FYM & SSP 10:1 ratio • Closing holes of bunds for checking water loss 	
		Paddy-Greengram/Black gram			
Plain land	Paddy	<ul style="list-style-type: none"> • Sheath rot and sheath blight in 	<ul style="list-style-type: none"> • Apply green leaf manure & 		

	irrigated and lowland		rice is more common and control it by application of validamycin (0.3%) <ul style="list-style-type: none"> • Raising of community nursery • Gap filling using same age of seedling 	FYM for water conservation	
		Paddy-Greengram/ Black gram			
		Paddy-Lathyrus			

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	Plain land irrigated-upland	Sole crops <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Post emergence application of Quizalofop ethyle @ 1 lit / ha to control weeds in ground nut • Complete hoeing ,weeding in non-paddy crop • Leaf miner in groundnut can be controlled by spray of Triazophus @ 2ml/ltr. • Spray of 1 % urea in vegetables • Spray of Planfix @ 10 ppm to control fruit drop in brinjal • Plant protection for mealy bug & mites in brinjal by application of Dicofol 2ml/lit. • Foliar application of 2% urea at pre-flowering stage in Greengram to mitigate drought • Termite control can be done by basal application of Chloropyriphos dust @ 25kg/ha. • YMV can be controlled by spray of Rogor @ 2ml/ltr. • Leaf blight in cucurbits can be controlled by application of Dithane M 	<ul style="list-style-type: none"> • Mulching with dry grass • Thinning of excess plant to optimize plant population to reduce transpiration • Ridge and furrow method of irrigation • Spray of Kaoline to reduce transpiration loss of water • Inter cultivation • Conservation furrow • Compartmental bunding. • Follow strip cropping in rolling topography for moisture conservation. 	

			45@ 3g/ltr.		
	Plain land irrigated medium land	<ul style="list-style-type: none"> Paddy <p>Paddy-Greengram/Black gram</p>	<ul style="list-style-type: none"> Weeding & gap filling using seedling of same age Grasshoppers is controlled by application of chloropyriphos dust @ 20 kg/ha. Mealybugs can be controlled by spray of metasystox 2ml/l. Blast is controlled by application of Tricyclozole @ 300g/ha. Avoid topdressing of N fertilizer till receipt of rain fall 	<ul style="list-style-type: none"> Close drainage hole to prevent seepage loss Measures to reduce runoff for groundwater recharge Provide life saving irrigation 	
	Plain land irrigated – low land	<p>Paddy</p> <hr/> <p>Paddy-Greengram/ Black gram</p> <hr/> <p>Paddy-Lathyrus</p> <hr/> <p>Composite Pisciculture in the farm fond</p>	<ul style="list-style-type: none"> No Beushaning if crop is more than 45 days Transplanting of rice seedling of 45 to 60 days can be done without affecting yield Use of puddler for quick puddling to save time 	<ul style="list-style-type: none"> Withhold N supply till rain starts Foliar application of 2% urea may be done Strengthen field bund and close drainage hole Provide life saving irrigation. 	

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	Plain land irrigated-upland	<p>Sole crops</p> <ul style="list-style-type: none"> Paddy Sesamum Arhar Green gram Black gram 	<ul style="list-style-type: none"> Foliar spray of 2 % urea at pre-flowering & post-flowering stage in greengram Spry of Planofix @ 20 ppm to reduce flower & fruit drop in Blackgram Harvesting of Blackgram and greengram at physiological maturity 	<ul style="list-style-type: none"> Spray of 2 % KCl & 0.1 ppm Boron in Blackgram to overcome drought Provide irrigation at critical stages i.e at flowering and grain filling Soil moisture 	

		<ul style="list-style-type: none"> • Kharif Veg. - Brinjal -Okra 	<ul style="list-style-type: none"> • Downy mildew in cucurbits can be controlled by application of Ridomil 2g/lit. • Bacterial wilt in brinjal can be controlled by soil drenching with Plantomycin 1g/lit. 	<p>conservation measures may be followed</p> <ul style="list-style-type: none"> • Harvesting at physiological maturity stage 	
	Plain land irrigated-medium land	<ul style="list-style-type: none"> • Paddy <p>Paddy-Greengram/Black gram</p>	<ul style="list-style-type: none"> • Provision of keeping standing water in the rice field during milking stage 	<ul style="list-style-type: none"> • Apply Potash fertilizer basing on soil moisture 	
	Plain land irrigated- low land	<p>Paddy</p> <p>Paddy-Greengram/Black gram</p> <p>Paddy-Lathyrus</p> <p>Composite Pisciculture in the farm pond</p>	<ul style="list-style-type: none"> • Weeding & plant protection measure for Blast can be undertaken • Provision of keeping standing water in the rice field during milking stage • Spraying of Malathion 1lit/ha to control Gundhibug • Dusting of Chloropyriphos dust @ 25 kg/ha to control cut worm 	<ul style="list-style-type: none"> • Apply Potash fertilizer basing on soil moisture • Strengthening of field bund to avoid loss of water 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		Remarks on Implementation
			Crop management	Rabi Crop planning	
Terminal drought (Early withdrawal of monsoon)	Plain land irrigated-upland	<p>Sole crops</p> <ul style="list-style-type: none"> • Paddy • Sesamum • Arhar 	<ul style="list-style-type: none"> • Harvesting at physiological maturity stage • Sprinkling of water for uprooting groundnut • Cowpea, maize may be harvested for fodder purpose • Provide irrigation at critical 		

		<ul style="list-style-type: none"> • Green gram • Black gram • Kharif Veg. - Brinjal -Okra 	stages of crops		
	Plain land irrigated-medium land	<ul style="list-style-type: none"> • Paddy <p>Paddy-Greengram/Blackgram</p>	<ul style="list-style-type: none"> • Provision of keeping standing water at panicle initiation & grain filling stage • Horse gram, castor, niger, black gram can be grown in residual moisture 	<ul style="list-style-type: none"> • Planning for pre-rabi crop • Check loss of water to recharge ground water • Greengram (PDM-54), Blackgram (Prasad) 	Seed supply through OSSC and Agriculture deptt.
	Plain land irrigated-lowland	<p>Paddy</p> <hr/> <p>Paddy-Greengram/Blackgram</p> <hr/> <p>Paddy-Lathyrus</p> <hr/> <p>Composite Pisciculture in the farm pond</p>	<ul style="list-style-type: none"> • Follow relay cropping or paira cropping • Provide life saving irrigation, from harvested rain water at reproductive stage • Harvesting at physiological maturity stage of crop 	<ul style="list-style-type: none"> • Check loss of water • Conserve moisture • Planning for Pre-Rabi crop with residual moisture • Utilization of residual moisture for early sowing of pre-Rabi crops like Greengram (PDM-54), Blackgram (Prasad) 	

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	Plain land irrigated Lift irrigated upland	Vegetables	<ul style="list-style-type: none"> • Cultivation of deep rooted vegetables like Brinjal • Choosing indeterminate variety of tomato • Cultivation of short duration vegetables e.g. Cowpea, Okra 	<ul style="list-style-type: none"> • Irrigation in alternate furrows • Mulching with dry leaves 	<ul style="list-style-type: none"> • Supply of vegetable seeds through horticulture department
	Canal irrigated	Rice-Greengram	<ul style="list-style-type: none"> • Selection of medium duration paddy 	<ul style="list-style-type: none"> • Lifesaving 	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Medium land		variety like Lalata, Manaswini, Konark, MTU-1010	irrigation when needed	
		Rice-Water melon	<ul style="list-style-type: none"> • Selection of medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 • Transplanting of watermelon seedlings raised in Polybag 	<ul style="list-style-type: none"> • Transplanting watermelon in ridge and furrow method 	
		Rice -Sunflower	<ul style="list-style-type: none"> • Selection of medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 • Ridge and furrow method of planting for sunflower 		
	Canal irrigated low land	Rice –Rice	<ul style="list-style-type: none"> • Selection of medium-late duration paddy variety like Swarna, Pooja, Pratikshya, Ranidhan • Rabi rice area should be diverted to non-paddy crops 		
Condition	Suggested Contingency measures				
Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation	
Limited release of water in canals due to low rainfall	Plain land irrigated Lift irrigated upland	Vegetables	<ul style="list-style-type: none"> • Cultivation of short duration vegetables e.g. Cowpea, Okra 	<ul style="list-style-type: none"> • Irrigation in alternate rows • Mulching with dry leaves 	
	Canal irrigated Mid land	Rice-Greengram	<ul style="list-style-type: none"> • Medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 	<ul style="list-style-type: none"> • Irrigation at flowering & pod setting stage 	
		Rice-Water melon	<ul style="list-style-type: none"> • Medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 • Transplanting of watermelon seedlings raised in polybag 	<ul style="list-style-type: none"> • Irrigation at critical stages • Moisture conservation measures 	
		Rice -Sunflower	<ul style="list-style-type: none"> • Selection of medium duration paddy variety like Lalata, Manaswini, Konark, MTU-1010 • Ridge and furrow method of planting 	<ul style="list-style-type: none"> • Irrigation at critical stages • Moisture conservation measures 	
Canal irrigated low	Rice-Rice	<ul style="list-style-type: none"> • Selection of medium-late duration 	<ul style="list-style-type: none"> • Irrigation at critical 		

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	land		paddy variety like Swarna, Pooja, Pratikshya, Ranidhan • Rabi rice area should be diverted to non-paddy crops	stages • Check the loss of water from the rice field	

Condition			Suggested Contingency measures		
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Plain land irrigated Lift irrigated upland	Vegetables	• Cultivation of short duration vegetables e.g. Cowpea, Okra	• Irrigation in alternate rows • Mulching with dry leaves	
	Canal irrigated Mid land	Rice-Greengram	-do-	• Irrigation at critical stages • Moisture conservation measures may be followed	
		Rice-Water melon	-do-	-do-	
		Rice -Sunflower	-do-	-do-	
	Canal irrigated low land	Rice -Rice	• Cultivation of short and medium duration paddy • Rabi rice area should be diverted to non-paddy crops	-do-	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Lift irrigated upland	Vegetables	<ul style="list-style-type: none"> • Cultivation of short duration vegetables e.g. Cowpea, Okra 	<ul style="list-style-type: none"> • Irrigation at critical stages Moisture conservation measures may be followed	
	Canal irrigated Medium land	Rice-Greengram	-do-	-do-	
		Rice-Water melon	-do-	-do-	
		Rice -Sunflower	-do-	-do-	
Canal irrigated low land	Rice -Rice	<ul style="list-style-type: none"> • Cultivation of short and medium duration paddy • Rabi rice area should be diverted to non-paddy crops 	-do-		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Not Applicable				

2.2 Unusual rains (untimely, unseasonal etc) (for both rain-fed 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				
Rice	<ul style="list-style-type: none"> • Drainage of excess water 	<ul style="list-style-type: none"> • Drainage of excess amount of water 	<ul style="list-style-type: none"> • Harvesting at 80 to 85 % grain maturity 	<ul style="list-style-type: none"> • Prevent wetting of grains to avoid germination

			<ul style="list-style-type: none"> • Drain out of excess water 	<ul style="list-style-type: none"> • Store after drying to safer moisture content • Shifting of produce to half cover threshing floor and other safer places for post harvest operation
Greengram	<ul style="list-style-type: none"> • Provide drainage 	<ul style="list-style-type: none"> • Provide drainage • Spraying of Endosulfan @ 1l/ha to control Podborers 	-do-	<ul style="list-style-type: none"> • Shifting of produce to half cover threshing floor and other safer places for post harvest operation • cover the crop to protect from moisture absorption
Black gram	-do-	-do-	-do-	-do-
Arhar	-do-	-do-	-do-	-do-
Sesamum	-do-	-do-	-do-	-do-
Horticulture				
Brinjal,	<ul style="list-style-type: none"> • Drainage of excess water 	<ul style="list-style-type: none"> • Drainage of excess water 	<ul style="list-style-type: none"> • Drainage of excess water 	<ul style="list-style-type: none"> • Cleaning ,washing & wiping of produce to avoid losses
Tomato,	-do-	-do-	-do-	-do-
Okra,	-do-	-do-	-do-	-
Chilly	<ul style="list-style-type: none"> • Provide drainage 	<ul style="list-style-type: none"> • Soil drenching with Bavistin & Plantomycin • Spray of Planofix to reduce flower drop (1ml in 4.5 l) 	<ul style="list-style-type: none"> • Harvesting in rain free dry weather to reduce post harvest loss Harvesting at proper maturity 	<ul style="list-style-type: none"> • Cleaning ,washing & wiping of produce to avoid losses
Heavy rainfall with high speed winds in a short span				
Horticulture				
Outbreak of pests and diseases due to unseasonal rains				
Rice	<ul style="list-style-type: none"> • Spray of Tricyclazole to control Blast • Spraying of validamycin @ 1.5 l/ha to control sheath blight • Spraying of Chloropyriphos @ 1.0 l/ha to control 	<ul style="list-style-type: none"> • Spray of Tricyclazole to control neck Blast • Spraying of Malathion @ 1.0 l /ha to control Gundhi bugs 	<ul style="list-style-type: none"> • Spraying of Endosulfan @ 1.0 l /ha during evening hour to control cutworm 	<ul style="list-style-type: none"> • Sun drying of paddy seed & storing in air tight polybags

	swarming caterpillar			
Greengram	<ul style="list-style-type: none"> • Spraying of rogor @ 1 lit/ha to control aphids • Dusting of Chloropyriphos dust @ 25 kg/ ha to control hairy caterpillar 	<ul style="list-style-type: none"> • Spraying of Endosulfan @ 1 lit./ha to control borers 		-do-
Blackgram	-do-	-do-		-do-
Arhar	<ul style="list-style-type: none"> • Spraying of Triazophos @ 1.0 l/ha to control leaf tier 	<ul style="list-style-type: none"> • Spraying of Endosulfan @ 1.0 l/ha to control borers 	<ul style="list-style-type: none"> • Spraying of Malathion @ 1.0 l /ha to control Bruchid 	<ul style="list-style-type: none"> • Sun drying of seed & storing in air tight poly bags with dried neem leaves
Sesamum	<ul style="list-style-type: none"> • Spraying of Chloropyriphos @ 1.0 l/ha to control leaf roller and jassids 	<ul style="list-style-type: none"> • Spraying of Chloropyriphos @ 1 lit./ha to control leaf roller and capsule borer 		<ul style="list-style-type: none"> • Sun drying of seed & storing in air tight poly bags
Horticulture				
Brinjal	<ul style="list-style-type: none"> • Soil drenching with Bavistin & Plantomycin to control wilt 	<ul style="list-style-type: none"> • Apply Blitox-50 @ 1.5 kg./ha for control of fruit rot in Brinjal 	<ul style="list-style-type: none"> • Spraying of Triazophos @ 1lt. /ha to control fruit & shoot borer 	<ul style="list-style-type: none"> • Cleaning ,washing & wiping of produce to avoid losses
Tomato	-do-	-do-	-do-	-do-
Okra	<ul style="list-style-type: none"> • Spraying of Rogor @ 1.0 ltr/ha to control YMV infection 	<ul style="list-style-type: none"> • Spraying of carbaryl @ 2.5 kg./ha to control fruit borer 		
Chilly	-do-	<ul style="list-style-type: none"> • Spraying of rogor @ 1.0 ltr/ha to control aphids and thrips • Apply Blitox-50 @ 1.5 kg / ha for control of dieback 		-do-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Rice	1. Select rice varieties like Durga,Uphar, Sarala, Varshadhan for semi-deep low lands & Swarna Sub-1 & sarasa for flash flood situations. 2.Drainage of excess water	1.Drainage of excess water	1.Drain excess water 2.Harvesting at physiological maturity	1. Keeping of harvested produce in field bunds and other higher places to avoid germination of grain
Mung	Provide drainage	1.Spray Rogor @ 2 ml / 1 to control white fly and aphids 2.Drain excess water from field	1. Spray of Dithane M 45 for control of rust 2. Spraying on Endosulfan @ 1.0 l/ha. to control pod borer 3. Drain excess water 4. Harvesting at physiological maturity	Sun drying of harvested produce in threshing floor
Biri	Provide drainage	1.Spray Rogor @ 2 ml / 1 to control white fly and aphids 2.Drain excess water from field	1. Spray of Dithane M 45 for control of rust 2. Spraying on Endosulfan @ 1.0 ltr/ ha. to control pod borer 3. Drain excess water 4. Harvesting at physiological maturity	Sun daring of harvested produce in threshing floor
Sesamum	Drain excess water from field	Drain excess water from field	1.Spraying of Chloropyriphos @ 1.0 l/ha to control leaf roller and capsule borer 2.Drain excess water	Sun drying of harvested produce in threshing floor
Arhar	-do-	-do-	-do-	-do-
Horticulture				
Brinjal	1. Raising of seedlings in raised beds. 2.Seedling root dip in solution of Bavistin & plantomycin	1. Management of Wilt 2. Digging of drainage channel 3. Regular surveillane of pest & diseases	1. Drenching of plant base with Carbendazim 2 gm + Plantomycin 1gm./lt. of water 2. Spraying Triazophos @ 1 .0lt./ha	-

	3.Apply Bleaching powder 15 kg / ha in soil 15 days before transplanting 4.Drain out excess water		to control fruit and shoot borer 3.Harvesting at proper maturity	
Tomato	-do-	-do-	1. Drenching of plant base with Carbendazim 2 gm. + Plantomycin 1gm./lt. of water 2. Spraying Endosulfan @ 1 .0 lt./ha to control fruit borer	-
Okra	Provide drainage	Spraying of rogor @ 1.0 l./ha to control YMV infection	Spraying of carbaryl @ 2.5 kg./ha to control fruit borer	-
Chilli	1.Raising of seedlings in raised beds. 2.Seedling root dip in solution of Bavistin & Plantomycin 3.Apply Bleaching powder 15 kg / ha in soil 15 days before transplanting 4.Drain out excess water	1.Spraying of rogor @ .0 l/ha to control aphids and thrips 2.Drain out excess water	1. Spraying of rogor @ 1lt./ha to control aphids and thrips 2.Apply Blitox-50 @ 1.5 kg / ha for control of dieback	-
Continuous submergence for more than 2 days				
Rice	Drain out excess water	Drain out excess water	1.Drain excess amount of water from field 2.Harvest at physiological maturity stage	1.Harvesting at 80 – 85 % of maturity of grain 2.Precution is taken in avoiding germination of seed 3.Relay cropping or paira cropping may be followed 4.Preventing wetting of seeds to avoid germination
Green gram	-	-	-	-
Black gram	-	-	-	-
Arhar	-	-	-	-
Sesamum	-	-	-	-
Horticulture				

Brinjal	Drain out excess water	Drenching of plant base with Carbendazim solution @ 2gm/lit	Drain excess amount of water from field	
Okra	Drain out excess water	Drain out excess water	Drain out excess water	
Chilli	Drain out excess water	Drenching of plant base with Carbendazim solution @ 2gm./lt	Drain excess amount of water from field	
Sea water intrusion not experienced				

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				
Rice	Adequate irrigation	Adequate irrigation	Irrigation at flowering & grain filling stage	
Horticulture				
Brinjal.,Tomato	Raising nursery in shade net house	Sprinkler method of irrigation	Spray of Planofix @ 1 ml /4.5 lit of water to check flower & fruit drop	Harvest in morning hour to escape from field heat of produce
Cold wave				
Horticulture				
Frost				
Horticulture				
Hailstorm				
Horticulture				
Cyclone				
Horticulture				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	<ol style="list-style-type: none"> 1. Awareness of farmer to stock feed and fodder 2. Encourage perennial fodder production 3. Village gaucher lands should be developed 4. On boundaries of agricultural field trees or shrubs like Sesbania, Subabul planted 5. It is essential to establish fodder bank near forest areas. 6. Excess fodder in flush season can be preserved as hay/silage. 7. Explore the possibilities of alternative feed 8. Organizing training Programme of persons connected with Animal Husbandry 9. Livestock insurance 	<ol style="list-style-type: none"> 1. Dry stray and feed to be given 2. Utilizing fodder from perennial trees 3. Transporting excess fodder from adjoining districts. 4. Utilizing the existing crops which fail to grow adequately due to failure of monsoon for feeding of animals. 5. Use of unconventional livestock feed such as sugarcane top, bagasse & banana plant 6. Improving poor quality roughages by ammonia treatment, urea treatment & feeding them. 7. Supplementation of mineral mixtures and vitamin 	<ol style="list-style-type: none"> 1. Hay and silage to be given 2. Supplementary feeding of remaining livestock and the replacement stock.
Drinking water	<ol style="list-style-type: none"> 1. Stocking of water in vat 2. Preserving water in community tanks 	Supply of clean drinking water	Supply of clean drinking water
Health and disease management	Stocking of DNS, salt and molasses	<ol style="list-style-type: none"> 1. Supply of RN-tose, DNS, Vit-B 2. Conducting animal health camps and treating the affected animals. 	<ol style="list-style-type: none"> 1. Rehydrate animals, common salt and molasses may be given 2. Proper disposal of dead animals
Floods			
Feed and fodder availability	<ol style="list-style-type: none"> 1. Sensitization of farmer to stock and protect feed and fodder 2. Training to the farmers about care of their animals preparation and distribution of leaflets 	<ol style="list-style-type: none"> 1. Supply of crushed maize, rice bran, wheat bran etc. 2. Procured feeds and fodder should be fed to all animals 	<ol style="list-style-type: none"> 1. Supply of crushed maize, rice bran, wheat bran etc. 2. Provision of supplementary feeding

	on livestock disaster.	3. Straws and stoves that got soaked during floods can be fed to animals as long as rotting or fungal growth has not set.	with vitamin and minerals
Drinking water	Stocking of clean drinking water	1. Arrangement for clean drinking water 2. Drinking water be made available to the animals in clean container	Chlorination of water and treatment with halogen tablets
Health and disease and shelter management	1. Vaccination 2. Prior construction of animal shelters in disaster prone areas. 3. Temporary relief camps can be set up to provide shelter 4. Keep the emergency service kit like Cotton wool, Bandages, surgical gauze, Disinfectants like Potassium permanganate, Dettol, Antibiotic 5. Temporary camps may be started for 25-50 animals in each group. 6. If no trees or sheds are available shelter the animals under a tent / tarpaulins	1. Treatment of sick animal 2. Their should be one veterinarian with 3 to 4 village to work 3. The team should be well equipped with contingent items like bandages 4. Keep the animals loose in paddock (sheltered or unsheltered) 5. Releasing animals from the unnatural and harmful position or situation stopping bleeding, binding broken limbs	1. De-worming 2. Prompt and appropriate attention to injured by providing necessary medicine 3. Vaccination campaign against common endemic disease 4. Improving shed hygiene especially in the farmers household through cleaning and disinfection
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave			
Shelter/environment management	1. Awareness creation 2. Green cover of trees 3. Proper sheltering / housing with white painting outside 4. Washing / wallowing / sprinkling or showering 5. Provision of cool drinking water 6. Cooling devices like fan, wet curtains and air	Shelter animal at cold windy and shaddy place	-

	cooler		
Health and disease management	Stocking of DNS, salt and molasses	Care of affected animal and should be over feed	1. Rehydrate animals 2. Common salt and molasses may be given
Feed management	1. Feeding green fodder / silage/hay 2. Provision for night feeding 3. Graze early in the morning and late in the afternoon		

Based on forewarning wherever available, (Source: CDVO, Boudh)

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	Ensure procurement of feed ingredients	Feed supplementation will be made	Attempt will be made for available of feed ingredient or compound feed to the farmers	-
Drinking water	Check water source for ensuring sufficient water	Attempt will be made to provided sanitized drinking water	Availability of water will be ensured by digging of bore well	
Health and disease management	Procurement of vaccines and medicines and antistress drugs, antibiotics	Continue feeding of anti stress drugs		
Floods				
Shortage of feed ingredients	Awareness of farmers to stock	Supply of poultry feed	Supply of poultry feed	Govt. Relief

	poultry feed			programme
Drinking water	Chlorination of water	Chlorination of water	Chlorination of water	-
Health and disease management	Vaccination	Treatment of sick Bird	De-worming	Govt. Relief Programme
Cyclone				
Heat wave and cold wave				
Shelter/environment management	<ol style="list-style-type: none"> 1. Covering windows with wet gunny bag and thatching roof with straw 2. Putting curtains on open sides of the shed. Procurement of electrical accessories Providing shed to poultry houses, Providing proper ventilation 	<ol style="list-style-type: none"> 1. Covering windows with wet gunny bag and thatching roof with straw 2. Attempt will be made for cooling of poultry shed 3. Thickness of litter should be reduced 4. Ventilation to the house should be increased by ceiling fans exhaust fan 	<ol style="list-style-type: none"> 1. Covering windows with wet gunny bag and thatching roof with straw 2. Provision should be made to ensure proper ventilation 	-
Health and disease management	<ol style="list-style-type: none"> 1. Vaccination 2. Procurement of Antistress drugs 	<ol style="list-style-type: none"> 1. Treatment of sick Bird 2. Supplementation of Antistress drug 	<ol style="list-style-type: none"> 1. Deworming 2. Vaccination of birds against RD 	Govt. Relief Programme
Feed resources	<ol style="list-style-type: none"> 1. Procurement of high protein and low energy diet 2. Procurement of medicine, Antistress drugs and vitamin C and E. 	Feeding during cooler hour of the day. Supplementation of vitamin E and C, Antistress drugs with water	Feeding will be continued with high protein and low energy till heat waves ends	
Water resources	Provision should be made for continuous available of water	Sufficient cool drinking water with sodium bicarbonate or electrolytes.	Availability of cold water will be made for some days	

^a based on forewarning wherever available (Source : CDVO, Boudh)

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/inflow	<ol style="list-style-type: none"> 1. Reduction in stocking density, regulation of out flow of water 2. Restricted release of water from reservoir. 3. Supplementary water harvesting structures like ponds and tanks has to be developed. 4. Renovation and maintenance of existing water harvest structures. 	Harvesting table sized fish	Restocking with yearlings
(ii) Changes in water quality	<ol style="list-style-type: none"> 1. Stocking of herbivorous fish and steps to minimize pollution 2. Prepare to release water into the habitat. 	<ol style="list-style-type: none"> 1. Harvesting table sized fish 2. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat. 	<ol style="list-style-type: none"> 1. Restocking with yearlings 2. Monitoring the water quality and health of aquatic organisms.
(iii) Any other	-	-	-
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ol style="list-style-type: none"> 1. Advised for production of yearling 2. Building deep ditches in culture ponds for shelter of the fish to overcome high temperature 	<ol style="list-style-type: none"> 1. Yearlings can be transferred to culture tank 2. Recharge the ponds with bore well water 3. Partial harvesting of the stock 	Pond preparation for yearling culture in next year
(ii) Impact of salt load build up in ponds / change in water quality	Application of organic manure in culture system	<ol style="list-style-type: none"> 1. Provision for aeration and water sanitation 2. Recharge the ponds with bore well water 	<ol style="list-style-type: none"> 1. Feeding and manuring as usual 2. Application of organic manure

(iii) Any other			
2) Floods			
A. Capture			
Marine	-	-	-
Inland			
(i) No. of boats / nets/damaged	1. Flood warning to fisherman, repairing of dykes 2. Non operation of fixed bag nets in streams and rivers. 3. Insurance coverage for nets and boats.	1. Advice the fisher man not to venture for fishing and take care of the implements 2. Checking of the safety of the boats / nets 3. Number of crew and load should be much below the marked tonnage.	1. Assessment of the damage and report to higher quarters 2. Maintenance of nets
(ii) No.of houses damaged	Insurance coverage for houses.	-	Settlement of insurance
(iii) Average compensation paid	1. Storage of sand filled bags for emergency use 2. Repair and maintenance of bunds 3. Preparedness for relief	1. Timely broadcast and telecast of danger level with respect to water level 2. Relief operation	1. Relief operation will continue 2. Financial support to other people
(iv) Loss of stock			1. Assessment of stock and replenishment 2. Habitat restoration for the stock remaining
(v) Changes in water quality	-	-	Application of lime
(vi) Health and diseases	Water quality management and prophylactic treatment	Mass treatment and isolation of diseased fish	1. Restocking with yearling 2. Observation of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds
B. Aquaculture			

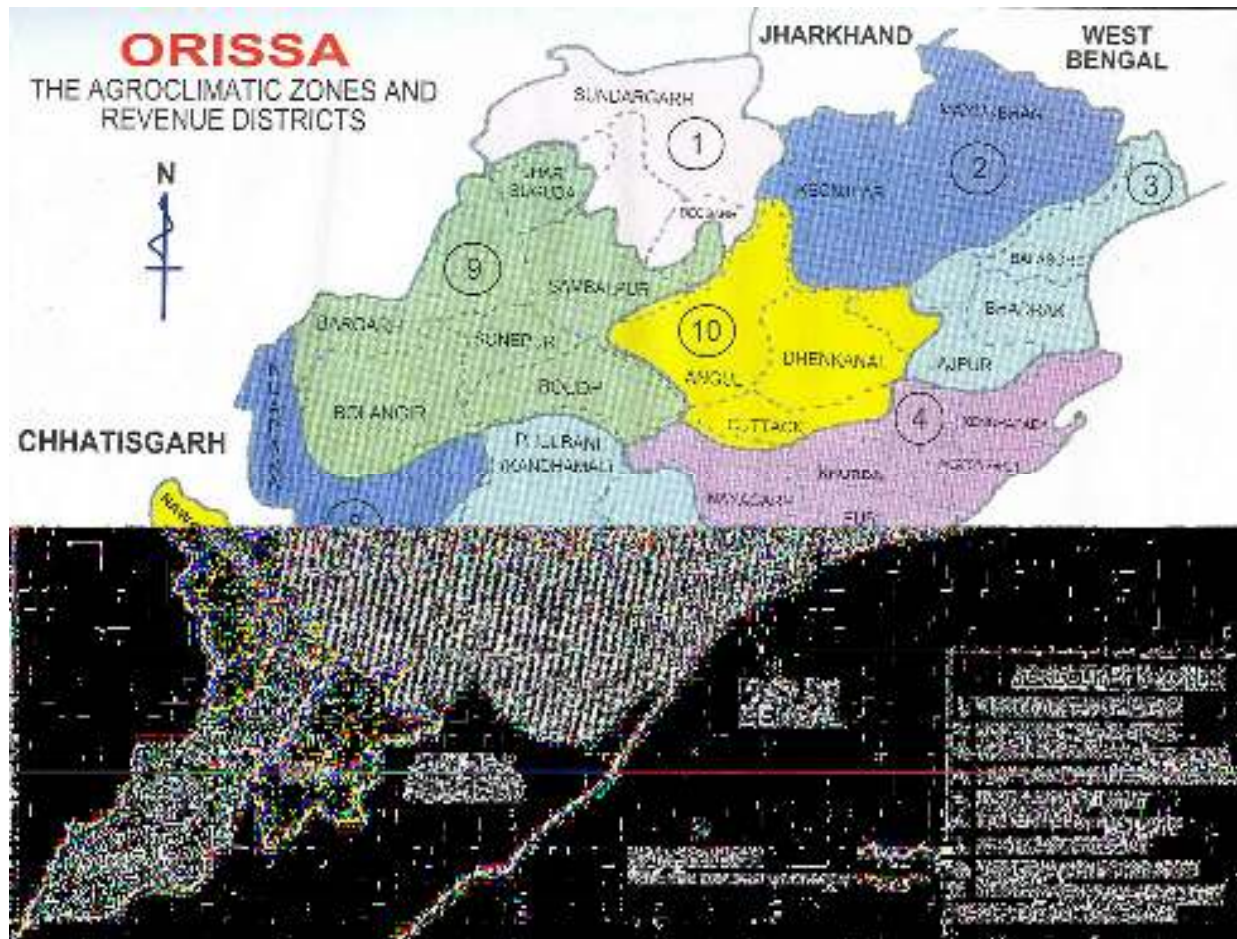
(i) Inundation with flood water	<ol style="list-style-type: none"> 1. Strengthening of dykes inlet and outlet system 2. Outlet and inlet facility should be their 	Net enclosure should be provided over the dyke to prevent the escape of fish from pond.	<ol style="list-style-type: none"> 1. In case of loss of stock restocking with yearlings or fingerlings 2. Repairing and strengthening of dyke
(ii) Water contamination and changes in water quality	Application of lime	Steps to drain out excess water	Application of Geolites, lime, Alum, $KMnO_4$
(iii) Health and diseases	Water quality management and prophylactic treatment	Mass treatment and isolation of diseased fish	<ol style="list-style-type: none"> 1. Application of Geolites, lime, Alum, $KMnO_4$ 2. Assessment of the health status of fish 3. Control on transport of brooders and seeds
(iv) Loss of stock and inputs (feed, chemicals etc)	<ol style="list-style-type: none"> 1. Strengthening of dykes and keeping the inputs in safe 2. Before flood the stock should be harvested 3. Construction of flood shelter for pumps, aerators etc. 4. Transport of feed and chemicals to safer place. 5. Purchase of feeds and chemicals 	<ol style="list-style-type: none"> 1. Not to allow any fish to escape out with suitable means. 2. Net enclosure should be provided over the dyke to prevent the escape of fish 3. Water should be diverted from the main stream. 4. Sand bags can be used for protection of dykes. 5. Storing of feed and chemicals to safer place 	<ol style="list-style-type: none"> 1. Stock assessment and restocking 2. Repairing of dykes 3. Assessment of quality of feed
(v) Infrastructure damage (pumps, aerators, huts etc)	Keeping all the implements in safer place		Repairing of pumps, aerators & damaged hut
(vi) Any other	-	-	-
3. Cyclone / Tsunami	-	-	-
A. Capture	-	-	-
Marine	-	-	-
(i) Average compensation paid due to loss of fishermen lives	-	-	-

(ii) Avg. no. of boats / nets/damaged	-	-	-
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine	-	-	-
Inland	-	1. During hot waves night fishing should be done 2. Preservation by cold chain should be increased during hot waves.	-
B. Aquaculture			
(i) Changes in pond environment (water quality)	1. Maintaining the water level to optimum 2. During hot waves adequate water depth should be maintained.	1. Provision for aeration and water sanitation 2. During hot waves mixing of water with fresh water 3. The culture system should be provided with aeration 4. Partial harvesting can be done	Provision for aeration and water sanitation

(ii) Health and Disease management	<ol style="list-style-type: none"> 1. Water quality management and prophylactic treatment 2. Application of lime and turmeric 	<ol style="list-style-type: none"> 1. Mass treatment and isolation of diseased fish 2. Feeding should be stopped 	Restocking with yearling
(iii) Any other			

Source-Asst. Director Fishery Office, Boudh

ANNEXURE-1 (a)



ANNEXURE-1 (b)

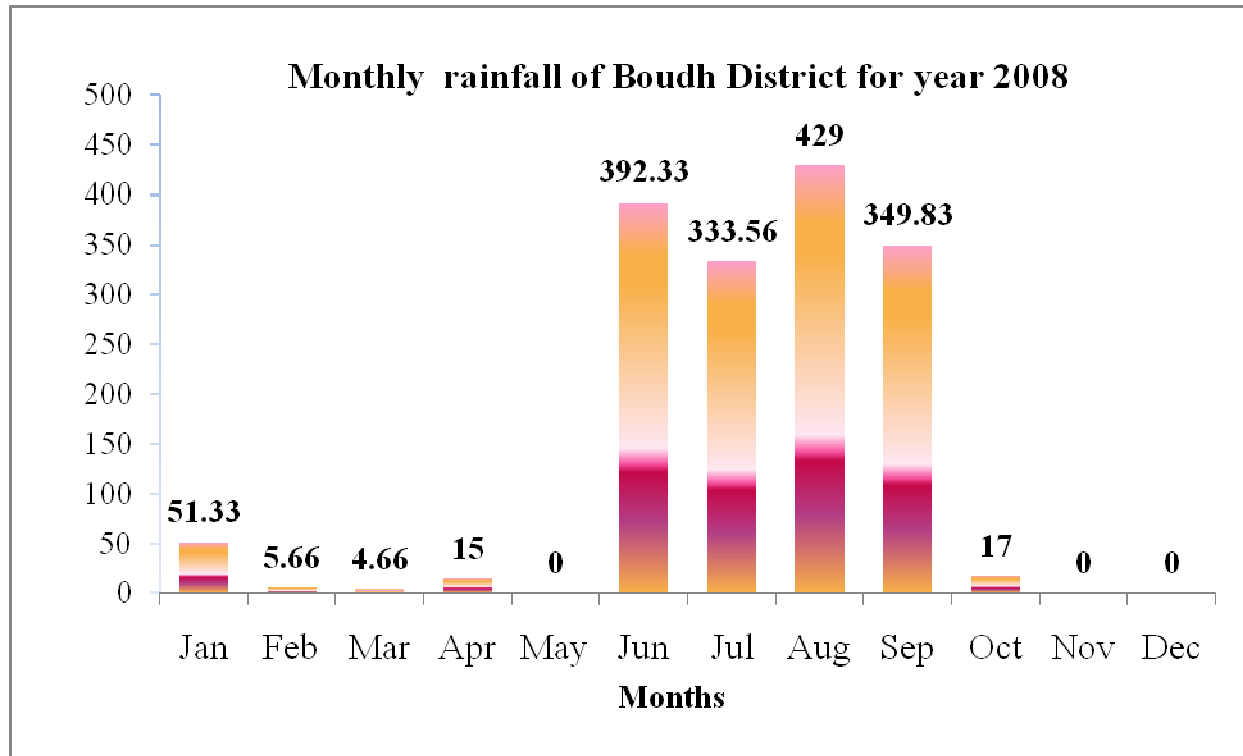


ANNEXURE-2(a)

Annual rainfall (mm.) of Boudh district over last 9 years (2001-09)

Year \ Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
2001	-	-	45.13	19.00	40.08	383.00	162.78	200.18	34.75	3.58	-	-	888.50
2002	19.50	-	15.35	15.04	66.77	241.40	126.57	467.25	240.72	20.83	-	-	1213.43
2003	-	31.30	51.60	09.20	12.84	224.65	429.45	620.89	284.90	157.7	09.00	41.26	1872.79
2004	08.50	36.40	05.33	34.53	41.28	239.30	510.50	350.30	151.23	81.00	-	-	1458.37
2005	35.00	07.00	-	-	11.67	114.93	550.69	292.66	328.32	167.30	-	-	1507.57
2006	-	-	50.00	27.00	85.33	139.00	425.21	332.48	150.70	11.00	20.00	-	1240.72
2007	-	-	-	11.30	45.00	436.10	242.46	207.62	429.93	09.00	-	-	1381.41
2008	51.33	5.66	04.66	15.00	-	392.33	333.56	429.00	349.83	17.00	-	-	1598.37
2009	-	-	-	-	-	54.00	642.78	390.86	152.60	21.30	-	-	1261.54

ANNEXURE-2(b)



ANNEXURE-3

Soil map of Boudh District

