

Agriculture Contingency Plan

Bargarh District (2022-23)

Submitted By:

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State: Orissa
Agriculture Contingency Plan: Bargarh District

1.0 District Agriculture profile			
1.1	Agro-Climatic/ Ecological Zone	West Central Table Land	
	Agro Ecological Sub Region (ICAR)	Eastern plateau (Chhotanagpur) (12.1)	
	Agro-Climatic Region (Planning Commission)	Eastern plateau & hills region (VII)	
	Agro Climatic Zone (NARP)*	Western Central table land zone (OR-9)	
	List all the districts falling under the NARP Zone	Bolangir, Sonepur, Boudh, Deogarh, Jharsuguda, Sambalpur, Bargarh	
	Geographical coordinates of district	Latitude	Longitude
		21 ⁰ 19ø45.42öN	83 ⁰ 37ø13.11ö E
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRTTS, Chiplima, Sambalpur-768028	
	Mention the KVK located in the district	KRISHI VIGYAN KENDRA , BARGARH at Gambharipali	
	Name & address of the nearest Agromet field unit (AMFU, IMD) for agro-advisories in the zone	RRTTS, Chiplima Bargarh Orissa - 768028	
1.2	Rainfall	Average (mm)	Normal Onset (specify week and month)
	SW monsoon (June-Sep):	1294.55	2 nd week of June
	NE Monsoon (Oct-Dec):	171.90	2 nd week October
	Winter (Jan-March)	120.30	-
	Summer (Apr-May)	153.10	-
	Annual	1367.3	-
			Normal Cessation (specify week and month)
			4 th week of September
			3 rd week of November
			-
			-
			-

* If a district falls in two NARP zones, mention the zone in which more than 50% area falls

1.3	Land use pattern of the district (latest statistics)	Geographical 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)	584	122	50	20	15	29	20	32	2

1.4	Major Soils (Common names)	Area ('000 ha)	Percent (%) of total
	1. Lateritic soil	-	Major dominating area- Attabira, Bijepur, Bheden, Bargarh blocks
	2. Mixed red & Yellow soil	-	Major dominating area- Part of Padampur and Gaisilet blocks-
	3. Red & Black soil	-	Major dominating area- Jharbandha, Sohela, Paikamal, Gaisilet blocks
	4. Brown forest soil	-	Major dominating area- Ambanana, Bhatli blocks
	Others (specify): Net cultivated area	349	60%
1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	330	142.4
	Area sown more than once	140	
	Net irrigated area	182	
	Gross cropped area	470	

1.6	Irrigation	Area ('000 ha)	Percent (%)	
	Net cultivated area	354	60 (of geographical area)	
	Net irrigated area	149.4	51.4 (of net cultivated area)	
	Gross cultivated area	471	80.6 (of geographical area)	
	Gross irrigated area	202	52.4 (of gross cultivated area)	
	Rainfed area	209	63.2 (of net cultivated area)	
	Source of irrigation	Number	Area ('000 ha)	% area
	Canals	30	90.619	48.0
	Tanks	2178	21.820	-
	Open wells	4344	6.250	-
	Bore wells	3580	7.160	-
	Lift irrigation	625	12.763	4.49
	Other sources	-	-	-
	Total irrigated area	-	-	-
	Pump-sets	-	-	-
	Micro-irrigation			
	Groundwater availability and use	No. of blocks	% area	Quality of water
	Over exploited	Nil	-	-
	Critical	Nil	-	-
	Semi-critical	Nil	-	-
	Safe	11	92	Good
	Wastewater availability and use	1	8	Manageable
	Ground water quality	District affected in part (5 %) with problems such as fluoride > 1.5 mg/l, iron, > 1.0 mg/l and nitrate > 45 mg/l. There is need of rain water harvesting to artificially recharge the ground water for safe domestic use		

*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%

Area under major field crops & horticulture etc. as per latest figure (2022)

1.7	Field crops-	Total area('000 ha)	Irrigated('000 ha)	Rainfed('000 ha)
1	Paddy	331.751	231.084	100.667
2	Groundnut	15.578	3.215	12.363
3	Maize	2.23	1.26	0.97
4	Sugarcane	0.397	0.397	-
5	Greengram	30.086	7.317	22.769
6	Blackgram	7.17	0.141	7.03
	Horticulture crops- Fruits	Total area ('000 ha)	Irrigated ('000 ha)	Rainfed ('000 ha)
1	Mango	0.757	0.627	0.130
2	Guava	0.16	N.A.	N.A.
3	Citrus	0.041	0.022	0.019
4	Litchi	0.04	N.A.	N.A.
5	Sapota	0.20	NA	NA
	Horticulture crops- Vegetables	Total area ('000 ha)	Irrigated('000 ha)	Rainfed ('000 ha)
1	Potato	1.202	1.202	0
2	Onion	1.512	1.512	0
3	Sweet Potato	0.280	0.050	0.230
	Medicinal and Aromatic crops	Total area('000 ha)	Irrigated('000 ha)	Rainfed('000 ha)
1		N.A	N.A.	0.01
2	N.A.	N.A.	N.A.	N.A.
3				
	Plantation crops	Total area('000 ha)	Irrigated('000 ha)	Rainfed('000 ha)
1	Coconut	0	N.A.	N.A.
2	Banana	0.212	0.212	0.0
3	Papaya	0.01	N.A.	0.01
4.	Others	1.91	N.A.	N.A.
	Fodder crops	Total area('000 ha)	Irrigated('000 ha)	Rainfed('000 ha)

	1	N.A.	N.A.	N.A.	N.A.
	2				
		Total fodder crop area	2	1.5	0.5
		Grazing land			
		Sericulture etc.	Nil	-	-
		Others (specify)			

*If break-up data (irrigated, rainfed) is not available, give total area

1.8	Livestock	Number ('000)		
	Cattle	129.021		
	Buffaloes total	9.978		
	Commercial dairy farms	N.A.		
	Goat	162.631		
	Sheep	58.634		
	Others (Camel, Pig, Yak etc.)	8261		
1.9	Poultry			
	Commercial	375.758		
	Backyard			
1.10	Inland Fisheries	Area (ha)	Yield (MT/ha)	Production (in MT)
	Brackish water	-	-	-
	Fresh water	1600	2.5	4012
	Others			

1.11 Production and Productivity of major crops (Avg.of last Five Years)

1.11	Production and Productivity of major crops	Kharif		Rabi		Summer		Total	
		Major field crop	Production (-000 t)	Productivity (kg/ha)	Production (-000 t)	Productivity (kg/ha)	Production (-000 t)	Productivity (kg/ha)	Production (-000 t)
Crop 1	Paddy	1088.437	4550	502.783	6350			1591.22	
Crop 2	Maize	6.452	3520	3.252	5220			9.704	
Crop 3	Groundnut	25.706	2000	6.622	2430			32.328	
Crop 4	Black Gram	2.203	320	0.147	510			2.35	
Crop 5	Green Gram	8.606	370	4.363	540			12.969	
Others									
	Major Paddy								
Major Horticultural crops									
Crop 1	Potato	-	-	12.631	10430	-	-		
Crop 2	Sweet Potato			300	2270	-	-		
Crop 3	Chili	2.715	6500	21.279	9260				
Crop 4	Coriander			9.708	6700				
Crop 5	Onion			31.982	10300`				
Crop 6									
Others									

1.12	Sowing window for 5 major crops (start and end of sowing period)	Crop 1: Paddy	2: Groundnut	3: Vegetable	4: Sugarcane	5: Oilseeds
	<i>Kharif-Rainfed</i>	<i>June – July</i>	<i>July-Aug</i>	<i>July-Aug</i>	<i>July-Aug</i>	<i>July-Aug</i>
	<i>Kharif-Irrigated</i>	<i>June – July</i>	<i>June – Aug</i>	<i>July-Aug</i>	<i>July-Aug</i>	<i>July-Aug</i>
	<i>Rabi-Rainfed</i>	<i>Nov-Dec</i>	<i>Dec – Jan</i>	<i>Nov - Feb</i>	<i>Nov-Dec</i>	<i>Dec – Jan</i>
	<i>Rabi-Irrigated</i>	<i>November – Dec</i>	<i>Dec – Jan</i>	<i>Nov- Feb</i>	<i>Nov-Dec</i>	<i>Dec – Jan</i>

1.13	What is the major contingency the district is prone to? (Tick mark)	Regular			Sporadic (specify month of occurrence in brackets)			None
		Severe	Moderate	Mild	Severe	Moderate	Mild	
	Drought	-		Y	-		July, & Sept.	-
	Flood	-	-	Y	-		August	-
	Cyclone	-	-	Y	-		October	-
	Hail storm	-	-	Y	-		May	
	Heat wave	-	-	Y	-		April, May	-
	Cold wave	-	-	Y	-		Dec.	
	Frost	-	-	-	-	-	-	
	Sea water inundation	-	-	-	-	-	-	NONE
	Pests and diseases (specify)	Stem borer in paddy, Pod borer in Arhar, Collar rot in Groundnut, Fruit & shoot borer , leaf curl virus in vegetables	Red rot in Sugarcane, Leaf folder and case worm in paddy, Sheath blight in paddy, Powdery mildew in	Termite, Mango hopper, Fruit flies, Ant	Swarming caterpillar in Aug/sept., BPH in Paddy, hispa in paddy	BLB in Paddy, Panicle mite in paddy	Root knot nematode	-

			greengram					
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1.14	Include Digital maps of the district for	Location map of district with in States as Annexure 1	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			Suggested Contingency Measures		
Early season drought (delayed onset)	Major Farming situation ^s	Crop/cropping system	Change in crop/cropping system ^s	Agronomic measures	Remarks on Implementation
Delay by 2 weeks (June 4 th week) * (REFER TO THE MATRIX TABLE)	1.Low rainfallShallow Lateritic soil	a) Upland rice-fallow based b) Groundnut c) Arhar- UPAS-120 Green gram- local variety	Paddy: sahabhagi Dhan, DRR-44, DRR-42 Intercropping like rice + Arhar(5:2), rice + blackgram (1:4)), rice + groundnut(4:1) Groundnut: Smruti, JL-24,Devi Arhar- ICPL-87119, BRG-4, PRG 176 Introduction of Ragi Subhadra,Chilka, Bhairabi - IPM 02-3, SML 668, Durga	1)Re-sowing of seed 2) Conservation of moisture by not ploughing 3) line Sowing of maize with seed drill. 4) Reduce application of N , increase application of P. Application of FYM to increase water holding capacity of soil seed treatment with Rhizobium, PSB	Supply of seeds through OSSC , through NFSM

	<p>2. Scarce rainfall laterite, lateritic, mixed red & yellow rainfed</p>	<p>a) Medium land rice-fallow</p> <p>b) Maize- hybrid</p> <p>c) Groundnut JL-24, Smruti, Barapataria</p> <p>Arhar- Asha</p>	<p>Direct sowing can be done.</p> <p>Growing of Medium duration rice variety: (120-135 days), Lalat, MTU-1075, MTU -1156</p> <p>Short duration maize hybrids like Pioneer30R-77, Bio seed- 9681, Sweet corn- Madhuri, Misti, Sugar -75,</p> <p>Groundnut- (Devi, TAG 24)</p> <p>Arhar- BRG-4, UPAS-120</p>	<p>Use of bulky organic manures is recommended</p> <p>Maintain more plant population for direct seeded rice.</p> <p>Nursery can be raised for transplanting after 21 days.</p> <p>Transplanting with 3-4 seedlings/hill with closer spacing</p> <p>In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.</p> <p>Wider spacing 90x30 cm for arhar</p>	<p>Breeder seed from OSSC, Seed drills from RKVY, BSP & NSP unit</p>
	<p>3. Mixed red & Blackrainfed</p>	<p>a) Vegetable-fallow</p>	<p>Growing of short duration vegetable like Radish, cucumber, okra, Cowpea in bunds of upland paddy</p>	<p>Ridge and furrow methods of sowing. at closer plant-to-plant distance with wider inter-row spacing.</p> <p>Sowing seeds in</p>	<p>Seeds from RKVY, OSSC, OUAT</p> <p>Supply of seeds from RRTTS, OUAT</p>

		<p>b) Sesamumlocal</p> <p>c) Greengram - local</p>	<p>- Sesamum ó Uma, Prachi, Amrit</p> <p>GreengramóIPM 02-3,</p>	<p>disposable glasses, Pro-trays Strengthen the field and contour bunds for in-situ moisture conservation. Use of mulch with locally available materials. Broadcasting at first shower of rainfall, thinning Closer spacing, broadcasting, conservation furrows</p>	
4. Low rainfall shallow Sandy loam soil	<p>Groundnut- Vegetable Maize Vegetable: Brinjal local Chilli local, Tomato BT-10</p>	<p>Groundnut variety like Smruti, Devi, Intercropping of maize with Cowpea (UtkalManik Kasi unnati,) in 1:2 ratio or Maize+Arhar in 2:1 ratio to manage water Shortage Brinjal- Utkal Kesari, Swarna Shyamali Chilli- Utkal ava,Tomato- Utkal Raja</p>	<p>Earthing up of Groundnut at right time, split application of fertilizer reduced to two times</p> <p>Transplanting older seedlings with wider spacing than recommendation, Thinning, Mulching with paddy straw</p>	<p>Seed drill under RKVY, Supply of seeds from OSSC Supply of seeds through NFSM, BSP unit</p>	

Condition			Suggested Contingency Measures
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Early season drought (delayed onset)	Major Farming situation ^s	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks (July 2 nd week) * (REFER TO THE MATRIX TABLE)	1.Low rainfall Shallow Lateritic soil	a) Upland rice-fallow based b) Groundnut-fallow	. legume based intercropping system like, groundnut + black gram/ green gram/ cowpea/horsegram/sesamum in the ratio of 4:1 Groundnut:DEVI, Smruti, AK-12-24. Black gram: TU-94-2, PU30, Sarada. Green gram: K-851, Dhauli. Hours gram:Urmi, Madhu. Sesame: Kanak, Konika, Uma	1) Line sowing behind plough 2) Conservation of moisture through plastic mulching 4) Splitting nutrient application 5) Thinning to retain one seedling at 30 cm 6) soaking of seeds in water overnight before sowing	Supply of seeds through OSSC , through NFSM, NMOOP Centres
	2. Scarce rainfall laterite, lateritic, mixed red & yellow rainfed	Medium land paddy	Direct sowing is not recommended after 10 th July but transplanting can be done from previously sown nursery. Medium land rice: Lalat, Swarna, Masoori, Pratikhya	RaiseNursery over polythene sheet or cemented floor for transplanting after 21 days Emphasis should be given In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge. Use of herbicides	

	3. Mixed red & Black rainfed	a) Vegetable-fallow c) Blackgram- local	Growing of short duration vegetable like cucumber, bittergourd, country bean, okra, Cowpea in bunds of upland paddy Blackgram 6TU-94-2, Ujala, Prasad, PU 31	Sowing in pits with little weeding, Mulching Broadcasting with 1 st shower of rain Application of pre-emergence herbicide	Seeds from NHM Supply of seeds from OSSC, OUAT Seeds may be procured from NFSM
	4. Low rainfall shallow Sandy loam soil	Maize- Vegetable Vegetable: Brinjal local Chilli local, Tomato BT-10, Utkal Raja	Maize hybrids of shorter duration, intercropping of maize with Cowpea (UtkalManik) in 1:2 ratio manage water Shortage Brinjal- UtkalAnooshree, Chilli- Utkalava, Utkal Rasmi, Tomato- Utkal Raja	Wider spacing at 60x45 cm, split application of fertilizer reduced to two times Transplanting older seedlings with wider spacing than recommendation, Thinning, Mulching with paddy straw	

Condition	Major Farming situation ^s	Crop/cropping system	Suggested Contingency Measures		
			Change in crop/cropping system ^s	Agronomic measures	Remarks on Implementation ^s
Early season drought (delayed onset) Delay by 6 weeks (July 4 th week) * (REFER TO THE	1. Low rainfall Shallow Lateritic soil	a) Upland rice-fallow	In the event of late arrival of southwest monsoon, the pulses like cowpea, blackgram, greengram can be grown upto last week of July but pigeonpea, groundnut, maize are not	Seed treatment with Vitavax power @ 2.5g/kg seed and proper plant protection measures should be taken to avoid any germination failure	Supply of seeds through OSSC, through NFSM

MATRIX TABLE)			<p>recommended to be sown after 20th July.</p> <p>Short duration improved varieties of vegetables like Tomato, Okra, Cucumber, Amaranthes, country bean etc</p>	<p>because sowing has already got delayed because of late onset of monsoon.</p> <p>In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.</p> <p>The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be placed as basal.</p> <p>The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing.</p> <p>Use of bulky organic</p>	
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		b) Vegetable		manures is recommended. Sowing of seeds in ridges, pits with proper seed treatment to avoid mortality,	
	2. Scarce rainfall laterite, lateritic, mixed red & yellow rainfed		Shifting from traditional crops/varieties to short duration low water requiring crops in upland, by substituting rice totally. Rice varieties like Lalat, Masuri are suitable.	In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge. Seed treatment and proper plant protection measures should be taken to avoid any germination failure because sowing has already got delayed because of late onset of monsoon. The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be	

				placed as basal. The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing. Use of bulky organic manures is recommended.	
3. Mixed red & Black rainfed	a) Vegetable-fallow b) Niger- local c) Blackgram- local	Growing of short duration vegetable like cucumber, bittergourd, country bean, okra, Cowpea in bunds of upland paddy Niger- Deomali Blackgram 6TU-94-2	Sowing in pits with little weeding, Mulching Dry sowing 8-10 days before rains with 15% higher seed rate Broadcasting with 1 st shower of rain	Seeds from NHM Supply of seeds from OSSC, OUAT Seeds may be procured from NFSM	
4. Low rainfall shallow Sandy loam soil	Sunflower, Cowpea, Niger Sunflower- local, Cowpea-local, Niger- local	Sunflower- Jwalamukhi Cowpea- UtkalManik Niger- Deomali Other vegetables of short	Wider spacing at 60x45 cm, split application of fertilizer reduced to two times Transplanting older		

		Vegetable - fallow	duration	seedlings with wider spacing than recommendation, Thinning, Mulching with paddy straw Ridge & furrow method of sowing & staking	
Condition			Suggested Contingency Measures		
Early season drought (delayed onset)	Major Farming situation^s	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 8 weeks (August 2 nd week) * (REFER TO THE MATRIX TABLE)	1.Low rainfall Shallow Lateritic soil	Upland rice-fallow based	Shifting from traditional crops/varieties to short duration low water requiring crops like cowpea, blackgram, greengram by substituting rice totally. If the main crop is failed cultivation or re-sowing with fodder is the best option. Fodders can be harvested at any stage keeping in view sowing of the next <i>rabiseason</i> crop	The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be placed as basal. Furrow sowing of crops at closure plant-to-plant distance with wider inter-row spacing is recommended.	Supply of seeds through OSSC , through NFSM
	2. Scarce rainfall laterite, lateritic, mixed red & yellow rainfed	Medium land rice-fallow based	Shifting from traditional crops/varieties to short duration rice. Rice varieties like Sahabhagi dhan ,Vandana (100-110 days)	In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.	Supply of seeds through OSSC , through NFSM

			<p>are useful in this situation.</p> <p>If the main crop is failed re-sowing with pre-rabi crops like horse gram, sesamum will give good return. Winter maize can be grown for the purpose of green cob.</p>	<p>Seed treatment and proper plant protection measures should be taken to avoid any germination failure because sowing has already got delayed because of late onset of monsoon.</p> <p>The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be placed as basal.</p> <p>The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing. Use of bulky organic manures is recommended.</p>	
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	3. Mixed red & Black rainfed	a) Vegetable-fallow b) c) Blackgram- local	Growing of short duration vegetable like cucumber, bittergourd, country bean, okra, Cowpea in bunds of upland paddy Blackgram 6TU-94-2	Sowing in pits with little weeding, Mulching Broadcasting with 1 st shower of rain	Seeds from NHM Supply of seeds from OSSC, OUAT Seeds may be procured from NFSM
	4. Low rainfall shallow Sandy loam soil	Vegetable-fallow	Growing short duration vegetable like cucumber, okra, Cowpea in bunded upland, Country bean in field bund	Ridge and furrow methods of sowing and staking. The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing. Use of bulky organic manures is recommended	

*Matrix for specifying condition of early season drought due to delayed onset of monsoon (2,4,6&8 weeks) compared to normal onset (2.1.1)

Normal onset (Month and week)	Month and week for specifying condition of early season drought due to delayed onset of monsoon			
	Delay in onset of monsoon by			
	2 wks	4 wks	6 wks	8 wks
June 1 st wk	June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk
June 2 nd wk	June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk
June 3 rd wk	July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk

June 4 th wk	July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk
July 1 st wk	July 3 rd wk	Aug 1 st wk	Aug 3 rd wk	Sep 1 st wk
July 2 nd wk	July 4 th wk	Aug 2 nd wk	Aug 4 th wk	Sep 2 nd wk

Condition					
Early season drought (normal onset)	Major Farming situation ^s	Crop/cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/ crop stand etc.	1. shallow lateritic soil	Upland rice- fallow Upland Maize Arhar- UPAS-120	In upland, rice will be damaged very quickly, result poor crop stand. The land may re-sown with low water requiring non-rice crops (greengram, blackgram) rather than allowing sub-optimal poor rice plant stand to persist. Gap filling of Maize should be done The field should be free of weeds for utilization of water and nutrients by the late sown crops A shorter duration variety like UPAS-120, ICPL-87 may be re-sown	Ridge and furrow methods of sowing may be adopted as in-situ soil moisture practices. Mulching should be practiced in between crop rows using locally available mulch material. Light irrigation during evening hours	

	2.Laterite, lateritic, mixed red & yellow rainfed	Medium land rice ó Fallow	<p>Direct seeded rice should be re-sown because sprouting drought will damage substantial rice area. But re-sowing of direct seeded rice should be avoided till sufficient rains have been received. Raising community nurseries of rice is recommended for transplanted rice. If sufficient good quality seed is not available, locally available seeds from adjoining areas should be used after proper germination check. Seeds treatment with Thiram or Captan @ 2-2.5 g/kg seed and other recommended plant protection measures.</p>	<p>Strengthen the field and contour bunds for in-situ moisture conservation.</p> <p>About 11-37 % run-off is generated even by the delayed monsoon and should be stored in the farm ponds or tanks. These will recharge ground water during normal or excessive rainfall year.</p>	
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	3.Mixed red & Black	Maize- vegetable	Gap filling of maize, Short duration high yielding vegetables like Tomato, Brinjal, Chilli, Kharif Onion(bhima red, ARDR), Crucifer vegetables	T conservation furrow Wherever economically viable, mulching should be practiced in between crop rows using locally available mulch material	
	4.Shallow sandy loam	Pulses -Vegetable	The land may re-sowed with low water requiring non-rice crops rather than allowing sub-optimal plant population. For anticipating prolonged dry spells, the practices of inter-row cropping help in risk sharing. This can be achieved by including a companion crop like green gram, cowpea than the main crops.	Wherever economically viable, mulching should be practiced in between crop rows using locally available mulch material.	

Condition	Major Farming situation ^s	Crop/cropping system ^s	Suggested Contingency Measures		
			Crop management	Soil nutrient & moisture conservation measure	Remarks on implementation ^s
Mid-season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					

At vegetative stage	1. shallow lateritic soil	Upland rice-fallow based Groundnut Arhar	T. In-situ rain water conservation, harvesting of excess runoff for re-use and ground water recharge. Conserve rainwater by increasing bund height Top dressing of fertilizers may be postponed till rainfall/ foliar application of nutrients	Wherever economically viable, mulching should be practiced in between crop rows using locally available mulch material. Application of post-emergence weedicide on broad leaf weeds to minimize competition for water	
	2.Laterite, lateritic, mixed red & yellow rainfed	Medium land rice-fallow based Groundnut	In-situ rain water conservation, harvesting of excess runoff for re-use and ground water recharge. Conserve rainwater by increasing bund height Application of fertilizer through foliar spray	Small and marginal farmers may be employed under NREGA for creating rain water conservation and storage structures like check dam/ cross bond to enhance productivity of their limited land.	
	3.Mixed red & Black	Pulses- vegetable	Application of light irrigation to avoid soil cracking Postponement of top dressing	Economically viable, mulching should be practiced in between crop rows using locally available mulch material.	

	4.Shallow sandy loam	Vegetable-fallow	Light irrigation Thinning & pruning of vegetables Lifesaving irrigation from harvested rainwater, wherever feasible, adopt micro-irrigation to save water.	Irrigating the crop in the root zone Sub-soil moisture conservation through minimum tillage Irrigate on ridge and irrigate every alternate furrow on rotation	
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Condition			Suggested Contingency Measures		
Mid-season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	Major Farming situation ^s	Crop/cropping system ^s	Crop management	Soil nutrient & moisture conservation measure	Remarks on implementation ^s
At reproductive stage	1. shallow lateritic soil	Upland rice-fallow based	Crops should be suitably thinned out Lifesaving irrigation if possible. Irrigate on ridge and irrigate every alternate furrow on rotation.	If fertilizers are to be applied, foliar application is recommended. Wherever economically viable, mulching should be practiced in between crop rows using locally available mulch material	
	2.Laterite, lateritic, mixed red & yellow rainfed	Medium land rice-fallow based Arhar	Lifesaving irrigation from harvested rainwater. Reduction of conveyance losses while irrigating the light textured soils. Spread a polythene sheet in the field channel before	If fertilizers are to be applied, foliar application is recommended. 1% KNO ₃ spray , kaolinite clay 2%	

			irrigating the field and then roll it back for irrigating the other field.		
	3. Mixed red & Black	Pulses- vegetable	-do-	If fertilizers are to be applied, foliar application is recommended	
	4. Shallow sandy loam	Vegetable-fallow	Light & frequent (if possible) irrigation to prevent flower drop Plucking vegetables for marketing	Spraying of anti-Transpirants to check evapotranspiration Mulching with crop trashes, spraying of 2% DAP	

Condition	Major Farming situation ^s	Crop/cropping system ^s	Suggested Contingency Measures		
			Crop management	Rabi Crop planning	Remarks on implementation ^s
Terminal drought	1. shallow lateritic soil	Upland rice-fallow based Arhar	Life saving irrigation from harvested rainwater, wherever feasible, adopt micro-irrigation to save crop. May be harvested for vegetable purpose Harvesting at physiological maturity	, Mustard, Horsegram, for month of October	Farm ponds from MGNREGS, RKVY Seeds from NHM, OSSC

	2. Laterite, lateritic, mixed red & yellow rainfed	Medium land rice-fallow based Maize-Arhar	Irrigation through pump where ever possible . Harvesting of rice at physiological maturity will realize 80-85% of normal yield. Harvesting of plants for fodder purpose if cob formation hampered	Raise Brinjal seedlings for Rabi, being a hardy plant it may withstand moisture stress condition Cowpea, Sunflower, Field bean, Horsegram, Blackgram, Sesamum for month of October	Farm ponds through watershed programme, MGNREGS
	3.Mixed red & Black	Pulses- vegetable	Vegetables approaching maturity may be harvested for marketing	Cowpea,Carrot, Radish, Marigold , onion ,Horsegram, Blackgram for month of October	Farm ponds through watershed programme, MGNREGS
	4.Shallow sandy loam	Vegetable-fallow	Vegetables approaching maturity may be harvested for marketing	Plan for short duration high yielding oilseed especially Mustard/Toria& horse gram crops Vegetables like, carrot. Radish, & other crucifers.	Farm ponds through watershed programme, MGNREGS

2.1.2 Drought- Irrigated situation

Condition			Suggested Contingency Measures
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Delayed/ limited release of water in canals due to low rainfall	Major Farming situation ^s	Crop/cropping system ^s	Change in crop/cropping system	Agronomic measures	Remarks on implementation ^s
	1. Upland tubewell Irrigated canal laterite soil	Upland rice-fallow based Groundnut (Smruti,Devi)	Vegetable, Oilseed, pulses	Limited &lifesaving irrigation Alternate furrow irrigation Drip irrigation Planting in deep furrows/Pit method of planting	Seeds through OSSC, NFSM,
	2. Medium land Canal irrigated laterite, lateritic, mixed red & yellow soil	Medium land rice-fallow based Pulses	Short duration paddy like khandagiri, sahabhagi, lalat, vandana Pulses, vegetable(Chilli, Tomato, Brinjal, Okra, Cauliflower)	Limited &lifesaving irrigation Alternate furrow irrigation Drip irrigation Mulching, Irrigation in root zone	Seeds through OSSC, NFSM, NHM Intercultural implements through NHM, ATMA,
	3. Tube well/ pond irrigated Shallow sandy loam soil	Paddy,	High yielding varieties with short duration	Mat nursery for delayed planting, direct seeding of pre-germinated seed through drum seeder Limited &lifesaving irrigation Alternate furrow	Seeds through OSSC, NFSM, NHM Intercultural implements through NHM, ATMA,

		Vegetable		irrigation Drip irrigation Mulching, Irrigation in root zone	
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Condition	Major Farming situation ^s	Crop/cropping system ^s	Suggested Contingency Measures		
			Change in crop/cropping system	Agronomic measures	Remarks on implementation ^s
Lack of inflows due to insufficient/delayed onset of monsoon	1. Upland tube-well Irrigated canal laterite soil	Upland rice-rice based	Rice area during rabi should be reduced. Instead, low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are preferred options.	Irrigate the kharif rice with groundwater during dry spells only, if dry spell comes before release of canal water. Reduction of conveyance losses while irrigating the light textured soils. Spread a polythene sheet in the field channel before irrigating the field and then roll it back for irrigating the other field.	
			Use of early duration variety like -MTU-1010ø (115 days) is well suited in rabi.Khandagiri (95 to 100 days)		

				critical stages only with groundwater.	
	2. Medium land Canal irrigated laterite, lateritic, mixed red & yellow rainfed soil	Medium land rice-fallow based Groundnut	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Same as above for kharif rice	
	3. Tube well/ pond irrigated Shallow sandy loam soil	Vegetable -fallow	High yielding varieties with short duration radish, leafy vegetables, okra	Limited & lifesaving irrigation Alternate furrow irrigation Drip irrigation	

Condition	Major Farming situation ^s	Crop/cropping system	Suggested Contingency Measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation ^s
Insufficient ground water recharge due to low rainfall	1. Upland tube-well Irrigated canal laterite soil	Upland rice-fallow based	. low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum are preferred options if any water is there for 2 nd crop.	Irrigate the kharif rice during dry spell with harvested rain water.	
				Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	
				About 11-37 % run-off is generated even by the delayed monsoon and	

				<p>should be stored in the farm ponds or tanks. These will recharge ground water</p> <p>During normal or excessive rainfall year. Rainwater stored in self-sealing or lined ponds can be used for irrigation if there is long break in the rainfall or for Pre-sowing of the <i>rabi</i> crops to ensure proper germination.</p>	
	2. Medium land Canal irrigated laterite, lateritic, mixed red & yellow rainfed soil	Medium land rice-fallow based Pulses, Vegetable	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Limited & lifesaving irrigation Alternate furrow irrigation Drip irrigation	
	3. Tube well/ pond irrigated Shallow sandy loam soil	Vegetable -fallow	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesame	Limited & lifesaving irrigation Alternate furrow irrigation	

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

Condition	Suggested contingency measures			
	Vegetative stage ^s	Flowering stage	Crop maturity stage	Post harvests
Continuous high rainfall in a short				

span leading to water logging				
Crop1 Groundnut	Provide drainage	Provide drainage	Drain water for drying Harvest at physiological maturity stage	Shifting to a safer place Dry in shade in a well ventilated space
Crop2 Paddy	No substantial problem as uplands do not maintain water logging condition for long time	Provide drainage If possible	Drain water for drying Harvest at physiological maturity stage	Shifting to a safer place Dry in shade in a well ventilated space
Crop3 Arhar	Provide drainage	Provide drainage	Drain water for drying Harvest for vegetable purpose	Safe storage against pest & diseases
Crop4 Cowpea	Provide drainage	Provide drainage	Drain water for drying Harvest for vegetable purpose	Shifting to a safer place Dry in shade in a well ventilated space Safe storage against pest & diseases
Crop5 Sugarcane	Provide drainage Maintain ridge & furrow method	Provide drainage Maintain ridge & furrow method	Harvest at physiological maturity stage	Extraction of jaggery
Horticulture				
Crop1 Fruits(Mango, Citrus etc)	Provide drainage Earthing up of plant base/root zone	Provide drainage Earthing up of plant base/root zone	Provide drainage Earthing up of plant base/root zone In case of established tree, no problem	Dry the fruits (prepare mango leather, Amchur powder), Keep at safer place, may be sold at green stage
Crop2 Banana, Papaya	Raising seedlings in sunken bed method	Provide drainage Earthing up of plant base/root zone	Harvested at green stage or table purpose, No problem for marketing as it has buyers preference	Store the matured fruits for ripening in closed godowns for marketing, immature fruits may be sold in the

					market.
Crop3	Cucurbit vegetables	Seedling in raised nursery beds, drainage,	Vines should be staked along elevated frames	Ensure drainage Harvesting at tender stages	If there is threat from heavy unseasonal rain go for raising the plant in disposable glass or in pro-tray in protected structure. Ensure drainage. Harvesting at tender stages
Crop4	Solanaceous/ cruciferous vegetables	Seedling in raised nursery beds, drainage,	Provide drainage Application of hormones to induce more flowering	Provide drainage	If there is threat from heavy unseasonal rain go for raising the plant in disposable glass or in pro-tray in protected structure. Ensure drainage. Harvesting at tender stages
Heavy rainfall with high speed winds in a short span²					
Crop1	Paddy	Drainage if water logging persists Small seedlings withstand the problem	Drainage if water logging persists Small seedlings withstand the problem	Lodged panicles may be harvested at physiological maturity stage	<i>Ensure drainage</i> If it is harvested keep it in higher level.if still water stagnation is there, shifting of harvested paddy to field bund.
Crop2	Sugarcane	Drainage if water logging persists Small seedlings withstand the problem	Bundling of canes And drainage	Lodged canes may be harvested for extraction of juice	Lodged canes may be harvested if it is matured or near to mature .if it is in early stage wrapping and propping of the cane.
Horticulture					
Crop1	Banana, Papaya	Raising seedlings in sunken	Provide drainage	Harvested at green stage or	Store the matured fruits for

	bed method	Earthing up of plant base/root zone	table purpose, No problem for marketing as it has buyers preference	ripening in closed godowns for marketing, immature fruits may be sold in the market.	
Crop2	Cucurbit vegetables	Seedling in raised nursery beds, drainage,	Vines should be staked along elevated frames	Ensure drainage Harvesting at tender stages	If there is threat from heavy unseasonal rain go for raising the plant in disposable glass or in pro-tray in protected structure. Ensure drainage. Harvesting at tender stages
Outbreak of pests and diseases due to unseasonal rains					
Crop1	Paddy	Spray tricyclazole against blast, Chloropyriphos against stem borer, profenophos , pro-cyper, lamda- cyhalothrin against Swarming caterpillar	Spray tricyclazole against blast, Chloropyriphos against stem borer, profenophos , pro-cyper, lamda- cyhalothrin against Swarming caterpillar& leaf folder	Malathion spray against Gundhi bug, poison bait with decomposed snail.	Sun drying / disinfection of gunny bags with malathion or heat treatment to manage stored grain pests
Crop2	Groundnut	Phorate granules in the whorls & spray of against groundnut pod borer	Spraying of mancozeb @0.3% propiconazole 0.2% against , <i>Cercospora</i> leaf spot	Spraying of Dimethoate , methyl demeton, imidachloprid against aphid	Store in clean godown, disinfection of gunny bags / storage structure with malathion
Crop3	Arhar	Removal of infested tips to manage leaf webber, spray of chloropyriphos @ 0.2%	Hand picking & destruction of blister beetles, dusting of chloropyriphos dust @8kg/ac	Spray of Ekalux profenophos , pro-cyper, lamda- cyhalothrin against against pod borer	Store in clean godown, disinfection of gunny bags / storage structure with malathion

Crop4 Blackgram/Greengram	Application of Triazophos Dimethoate , methyl demeton, imidachloprid to prevent sucking pest	Application of malathion against Flea beetle	Spray of Ekalux profenophos , pro-cyper, lamda- cyhalothrin against against pod borer	Disinfection of storage structure to manage stored grain pests
Horticulture				
Crop1 Solanaceous vegetables	Spraying malathion against hadda beetle, hand collection of egg mass Soil drenching of COC &streptocycline against wilting	Application of Neem oil &triazophos alternatively against brinjal fruit & shoot borer/ leaf curl virus,	Spraying of Spray of Ekalux profenophos , pro-cyper, lamda- cyhalothrin against against pod borer Metalaxyl against Anthracnose	Segregation of infested fruits & destruction by burning and burying
Crop2 Cucurbit vegetables	Spraying of Ekalux against Red pumpkin beetle, Collection & destruction of eggs/grubs, Soil drenching of COC &streptocycline against wilting	Spraying a Neem oil &triazophos against leaf eating caterpillars Metalaxyl against Powdery mildew, Carbendazim against leaf spot & blight	Poison baiting with Malathion &Jaggery against fruit fly	Destruction of overripe & infested fruits

2.3 Floods

Condition	Suggested contingency measures ^o			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation ¹				
Crop1 Paddy	Drainage of the Nursery bed, If not possible go for re-sowing after drainage of water.	Wet seeding of sprouted seeds (@75-80 kg/ha) of medium duration varieties (Lalat (120 days), Parijat (100 days), Konark (125 days), Surendra (135 days).	If flood comes during reproductive stage and damage is substantial, emphasis should be given on forthcoming	If flood comes during harvesting stage and damage is substantial, emphasis should be given on

		<p>50% N and 50% K₂O + full P may be applied as basal and rest 50% N + 50% K₂O as top dressing during the tillering stage.</p> <p>In partially damaged field gap filling may be done by redistributing the tillers.</p> <p>Management of pests & diseases</p>	<p>rabi crops.</p> <p>Supply of seeds and other agro-inputs of <i>rabi</i> crops at subsidized rate, provision of bank loan etc</p> <p>Wet seeding of short duration varieties (Heera (60 days), Kalinga 6III (90 days)) or medium duration varieties (Lalat (120 days), Parijat (100 days), Konark (125 days), Surendra (135 days) during forthcoming rabiseason.</p> <p>Utilization of residual soil moisture and use of recharged soil profile for growing pulses</p> <p>Growing of vegetables after receding flood water and adoption of integrated farming system to obtain more income and to compensate the loss during kharif.</p>	<p>forthcoming rabi crops.</p> <p>Supply of seeds and other agro-inputs of <i>rabi</i> crops at subsidized rate, provision of bank loan etc</p> <p>Utilization of residual soil moisture and use of recharged soil profile for growing pulses</p> <p>Growing of cucurbits after receding flood water</p>
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Crop2 Cotton	Drainage, If damping off then re-sowing	Ensure drainage, Make ridge & furrows	Ensure drainage, Make ridge & furrows	Harvest the boll as soon as possible
Horticulture	NOT A FEATURE OF FARMING SITUATION WHERE VEGETABLE IS GROWN			
Crop1 Radish	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing
Crop2 Leafy vegetable	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing
Continuous submergence for more than 2 days²	NOT A FEATURE OF THE DISTRICT			
Crop1 okra	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing	Drainage, If damping off then re-sowing
Horticulture				
Crop1				
Sea water inundation³	NOT A FEATURE OF THE DISTRICT DUE TO DISTANCE FROM SEA MORE THAN 350 KM			
Crop1				

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

Extreme event type	Suggested contingency measurer ^s			
	Seedling/ nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Crop1 (specify) Paddy	Irrigate nursery bed, maintain sufficient moisture level	Irrigate the field and maintain water level	Keep water in the field, Harvest the crop at physiological maturity	Early harvest of crop to avoid grain shattering keeping the produce in shade
Crop 2 Groundnut	Maintain sufficient moisture level in field	Maintain sufficient moisture level in field, Plant protection measure	Harvest the crop at physiological maturity	Keep the harvested crop in shed

		as per need		
Maize	Keep sufficient moisture in the field	Maintain sufficient moisture level in field, Plant protection measure as per need	Harvest the crop at physiological maturity and maintain moisture for tender cobs	Keep the harvested cobs in shed
Greengram/Blackgram	Keep sufficient moisture in the field	Maintain sufficient moisture level in field, Plant protection measure as per need	Harvest the crop at physiological maturity and maintain moisture for tender cobs	Keep the harvested produce in shed and well ventilated place
Horticulture				
Crop1 (specify)Mango	Irrigate the orchard at 3 to 4 days interval	Irrigate the orchard at 8 to 10 days interval, Irrigation by ring	Irrigate the orchard by 15 days interval	Irrigate the orchard by 15 days interval, Mulching can be practiced to keep moisture in soil
Papaya	Irrigate the field at 3 days interval	Irrigate the field at 5 to 7 days interval	Irrigate the field at 8 to 10 days interval, Ensure less fruit drop due to lack of moisture	Irrigate the field at 15 days interval, harvest the matured fruits
Banana	Irrigate the plot by ring and basin method at 7 days interval	Practice drip method of irrigation	Irrigate the plot at 10 days interval by drip irrigation	Irrigate the plot at 15 days interval by drip irrigation
Cold wave				
Crop1 Paddy	Sowing of sprouted seeds in nursery mulching	Drainage field and maintain moisture level. Interculture and need based plant protection measures	Maintain low moisture level, need based plant protection	Keep the harvested produce for dry and keep in dry place
Crop 2 Groundnut	Growing of sprouted seeds, mulching may be provided	Maintain moisture level of field, intercultural operation, plant protection measures.	Maintain low moisture level, need based plant protection	Drying of harvested produce and store in safer place
Crop 3 Maize	Sowing of sprouted seeds, mulching	Do not flood the field, intercultural operation and need	Do not flood the field. Measures for hand pollination in need. Need	Drying of harvested produce and keeping in

		based plant protection	basedplant protection	safer place
Crop 4 Greengram	Sowing of sprouted seedling to avoid cold injury	Do not flood the field, intercultural operation and need based plant protection	Maintain the moisture level in field, need based plant protection measure	Drying of produce and keeping in safer place
Horticulture				
Crop1 (specify) Mango	Restricted irrigation, Drip irrigation	Drip irrigation at 8 daysøinterval. Need based plant protection measures	Drip irrigation at 8-10 daysø interval. Need based plant protection measures	Restrict irrigation. Keep the produce in safer place to avoid cold injury.
Crop 2 Papaya	Restrict irrigation to avoid cold injury, use /encircle plastic net for protection	Drip irrigation at 8 daysøinterval. Need based plant protection measures	Drip irrigation at 8-10 daysø interval. Need based plant protection measures	Restrict irrigation. Keep the produce in dry place to avoid cold injury.
Crop 3 Banana	Restrict irrigation to avoid cold injury, Intercultural operation	Need based plant protection measures	Restricted irrigation, Need based plant protection measures	Restricted irrigation, Keep the produce in safer place
Frost				
Crop1				
Horticulture				
Crop1 (specify)				
Hailstorm				
Crop1 water melon	Restrict irrigation to avoid cold injury, use /encircle plastic net for protection	Need based plant protection measures- spray carbendazim + mancozeb to control fungal infection	Need based plant protection measures	Cover the fruits with paddy straw/ plastic bowls/ earthen pots
Horticulture				
Crop1 (specify)				
Cyclone				
Crop1				

Horticulture				
Crop1 (specify) bitter gourd		Trail the crop over soil instead of stacking		Pluck the semi matured fruits for sale
Banana		Before planting go for wind break by planting crop like bamboo, Arjun.	If possible go for propping with support/fixing of wooden poles	Sale mature fruits

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	Livestock insurance, encourage fodder cultivation in village grazing lands & near rivers, on boundaries of agricultural field trees or shrubs like Sesbania, Subabul etc. should be planted. Excess fodder may be stored as hay/silage, Establish fodder bank near forest areas, Training & awareness camp among extension personnels for needful at time of exigencies.	Utilizing fodder from perennial trees and fodder bank reserves. Transporting excess fodder from adjoining districts. Utilizing the existing crops which fail to grow adequately due to failure of monsoon for feeding of animals. Use of unconventional livestock feed such as sugar cane top, sugarcane bagasse, banana plant residues, water hyacinth, tree pods and seeds etc. Improving poor quality roughages by ammonia treatment, urea treatment, urea molasses mineral block etc. and feeding them.	Avail crop insurance. Supplementary feeding of remaining livestock and the replacement with new stock.
Drinking water	Preserve water in community tank & pond with sanitization, Well or dug well may be constructed in advance, Training & awareness camp among extension personnel.	Water sources from other places may be used in case of shortfall of exiting portable water, Animals not to be exposed to outside rather they should be community fed	Plan accordingly for next year

Health and disease management	Veterinary preparedness with vaccines & medicines, Training & awareness camp among extension personnel.	Conducting animal health camp and treating the affected animals, Supplementation of mineral and vitamin mixtures	Proper disposal of dead animals
Floods			
Feed and fodder availability	Livestock insurance, encourage fodder cultivation in village grazing lands & near rivers, on boundaries of agricultural field trees or shrubs like Sesbania, Subabul, etc should be planted, Excess fodder should be stored as hay/silage, Establish fodder bank with dry straw & dry feed for at least 15 days, Training & awareness camp among extension personnels for needful at time of exigencies.	Priorities animals as suckling animals, suckling animals along with their nursing mothers, producing and working animals, sick and old animals, adult open and non-producing animals as the feed and water may be in short supply. Procured feeds and foddors should be fed to all animals on the order of priority of animals. Straws and stoves that got soaked during floods need not be thrown away out right. They can be fed to animals as long as rotting or fungal growth has not set in. Partial drying chuffing and sprinkling concentrate mixture can improve intake and utility.	Provision of supplementary feeding (concentrate / Roughage) with vitamin & minerals mixtures.
Drinking water	Preserve safe drinking water in community tanks which is not prone to seepage of rain or flood water, Arrange chlorine tablets for sanitization of water and bleaching powder for disinfection of habitats & shelter places , Training & awareness camp among extension personnel.	Drinking water should be made available to the animals in any kind of clean container available with the farmer.	Provision of clean drinking water.
Health and diseases management	Prior construction of shelter places in elevated points, Vaccination of livestock. Keep the emergency service kit (first Aid Requisites) ready always. containing Cotton	There should be one veterinarian with 3 to 4 village to work with the help of local volunteers. The team should be well equipped with	Prompt and appropriate attention to injuries by providing necessary medicines to the livestock owners. Vaccination campaign against

	wool, Bandages, Surgical gauze, old cotton sheets, Rubber tubing (for tourniquet), Surgical scissors ó Curved and made of stainless steel, Forceps, Splints or Split bamboos (for fractures), Clinical thermometers, Potassium permanganate, Acriflvin, Dettol, Savlon, Tannic acid powder (for poisons) and Jelly (for burns) Antibiotic eye drops, Epsom salts, copper sulphate, Treacle, oil of turpentine (for bloat), Obstetric ropes, chains and hooks, Tincture of iodine, tincture of Benzoin Co.(for wounds), Cotton rope, halters (for restraint) & the like.	contingent items like bandages, tourniquet ropes, drugs including painkillers, antiseptics, antibiotics, anti-venom and anti-shock drugs etc. Keep the animals loose in paddock (sheltered or unsheltered) Releasing animals from the unnatural and harmful position or situation, binding broken limbs, administering painkillers, anti-poison and anti-shock drugs, performing euthanasia on hopelessly injured and suffering animals with the consent of their owners	common endemic diseases of the areas (like H.S. B.Q, Anthrax etc.) must be taken up urgently. Necessary steps should be taken for the control of non-specific digestive and respiratory infections in consultation of local veterinary personals. Improving shed hygiene especially in the farmersø household through cleaning and disinfection
Cyclone			
Feed and fodder availability	Keep stock of dry feed and fodder. Health check up.	Feeding livestock, health checkup for mechanical injury, wound, thunder blast, stroke, fever	Feeding livestock, health check up to avoid injury, wound, thunder blast, stroke, fever, pneumonia etc
Drinking water	Keep stock of drinking water, health checkup	Provide drinking water, health checkup for mechanical injury, wound, stroke, fever, antibiotic therapy etc.	Provide drinking water, health checkup for injury, wound fever etc and antibiotic therapy.
Health and diseases management	Health checkup before cyclone and vaccination according to need	Health checkup and antibiotic treatment for mechanical injury, wound thunder blast, stroke and fever and vaccination as per need	Health checkup for any mechanical injury, wound stroke, fever and give treatment accordingly
Heat wave and cold wave			
Shelter/ environment management	Prepare the shelter to prevent hot and cold wave. Wall should be prepared with temperature resistant structures. Electric fans/heaters to be used in the room.	For heat wave the shelter should be moisture and well ventilated. For cold wave the rooms / shelter should be kept warm and health checking for any heat / cold injury and treatment be given accordingly	Health checkup for any cold and heat injury or any symptom during to cold / heat wave and vaccination as per need

Health and diseases management	Health checkup and vaccinate as per need	Health checkup for any injury or any disorder owing to heat / cold wave and vaccinate and treat accordingly	Health checkup after the event and any disorder found treat / vaccinate accordingly.
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2.5.2 Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	<p>Insurance of Poultry farms</p> <p>Ensure procurement of feed ingredients sufficient ahead</p> <p>Establish feed serve bank</p>	<p>Feed utilization from feed bank</p> <p>Feed supplementation will be made to the farms.</p>	<p>Availing insurance</p> <p>Attempt will be made for available of feed ingredient or compound feed to the farmers</p>
Drinking water	<p>Check water source for ensuring sufficient potable water during draught</p>	<p>Attempt will be made to provide sanitized drinking water</p> <p>Availability of sufficient drinking waters from the borewell or dug well.</p>	<p>Availability of water will be ensured by digging of bore well</p>
Health and diseases management	<p>Procurement of vaccines and medicines and anti-stress agent.</p> <p>Feeding antibiotics</p> <p>Procurement of litter materials</p>	<p>Administration of vaccines</p> <p>Continue feeding of anti-stress agent</p>	<p>Culling of affected birds as per govt. decisions.</p>
Floods			
Feed and fodder availability	<p>Ensure procurement of feed ingredients / compound feed sufficient ahead as feed supply to the farm will hamper due to submergence of the connecting roads</p>	<p>Supply the compound feed to the poultry farm under submerged area</p> <p>Feeds should be available without affecting the flood water.</p>	<p>Supply will continued till the situation is under control</p>
Drinking water	<p>Protect the water sources from</p>	<p>Attempt will be made to provide</p>	<p>Water sources will sanitized with</p>

	submergence	sanitized drinking water	bleaching powder or any water sanitizer
Health and diseases management	Procurement of vaccines and medicines. Feeding antibiotics Procurement of litter materials	Continue feeding antibiotics Prevent entrance of flood water to the shed Replace wet litter Proper disposal of dead birds if any	Disinfection of the farm premises. Feeding antibiotics and deworming. Replace wet litter Disinfection of sheds. Proper disposal of dead birds if any
Cyclone			
Feed and fodder availability	Sufficient feed to be stored	Feeding poultry and health checkup for any injury or mortality	Feeding and health checkup for any injury or mortality
Drinking water	Sufficient drinking water to be stored	Provide drinking water and health check up	Provide drinking water and check health
Health and diseases management	Health checkup and vaccinate as per need	Health checkup for fowl cholera, Ranikhet disease, Broader mortality etc. and vaccinate accordingly	Health checkup for fowl cholera, Ranikhet disease, Broader mortality etc. and vaccinate accordingly
Heat wave and cold wave			
Shelter/ environment management	Prepare the shelter to prevent cold/heat wave	During heat wave measure to be taken to keep the shelter moist and should be well ventilated. During cold wave measures to prevent cold wave, keep the room/shelter warm by providing electric bulbs etc. Health checkup in both cases	Health checkup, Vaccinate accordingly
Health and diseases management	Health checkup and vaccinate accordingly to need	Health checkup for any cold or heat injury, broader mortality, any disorder and vaccinate accordingly	Health checkup for any mortality or disorder and vaccinate accordingly.

2.5.3 Fisheries

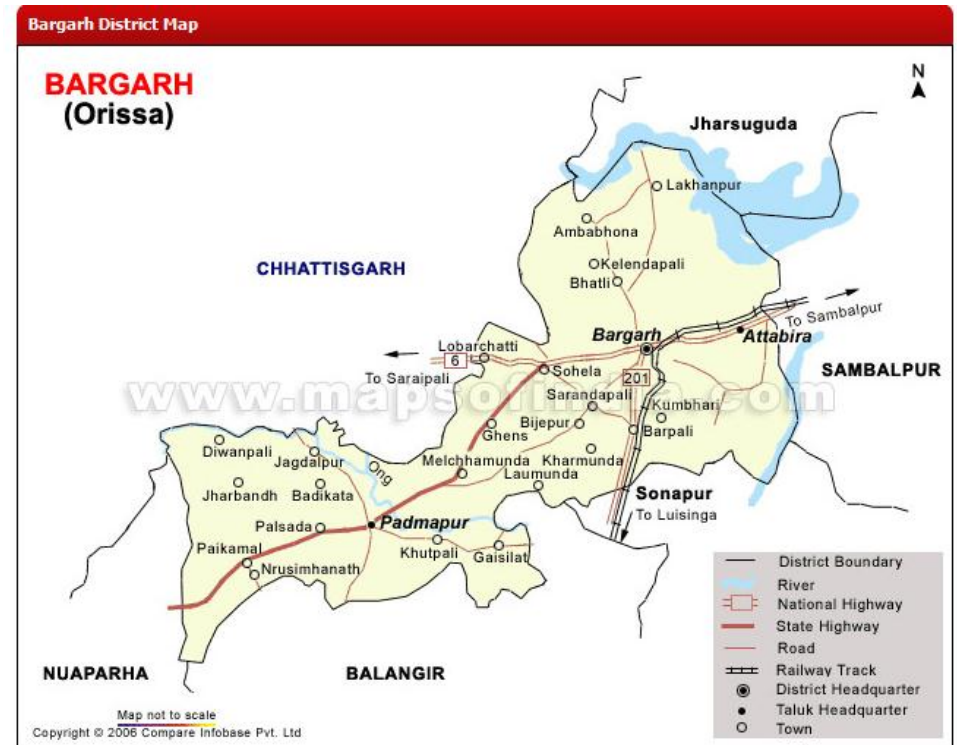
Suggested contingency measures

Drought	Before the event	During the event	After the event
Shallow water in ponds due to insufficient rains/inflow of water	<p>Supplementary water harvest structures like pond and tanks to be developed.</p> <p>Renovation and maintenance of existing water harvest structures.</p> <p>Preparing more depth of the ponds In central portion of the pond more depth to be prepared.</p>	<p>Restrict lifting of water for irrigation purpose of crops</p> <p>Catch the stock, market the produce to reduce the density of population in ponds.</p> <p>Putting some aquatic weeds like water hyacinth in the pond in a control condition by putting bamboo frame or plastic frame.</p> <p>Bigger size fishes can be harvested to reduce the mortality loss.</p>	<p>Excavate the ponds to increase the depth.</p> <p>Try to release water into the pond if it rains in off-season</p> <p>Sprinklers can be put in the pond water to reduce temperatures</p>
Impact of heat & salt load build up in ponds / change in water quality	Prepare to release water into the habitat	Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	Monitoring the water quality and health of aquatic organisms
Fish health	Table size fishes to be harvested.	Water to be added in the ponds.	Bigger size fish seed to be transferred to the better water holding ponds.
Floods			
Inundation with flood waters	<p>Construction of bundh.</p> <p>Storage of sand filled bags for emergency use.</p> <p>Repair and maintenance of bundhs.</p> <p>Insurance coverage provision for life</p>	<p>Timely broadcast and telecast and other types of announcement warning about the danger level with respect to water level.</p> <p>Evacuation of people to flood shelter areas.</p>	<p>Relief operation will continue.</p> <p>Care of health of affected people</p> <p>Settlement of insurance.</p> <p>Financial support to other people.</p>

	and property		
Water contamination & change in BOD	Take appropriate measures to check seepage into pond e.g. raising bunds to prevent entry of water	Check the water quality & take appropriate action Use of aerator in the pond	Application of lime and geolite. Application of Alum. Application of KmnO4
Health and diseases management	Stock preventive medicines, vaccines Infected fishes to be removed from the ponds. Predatory fishes like channa, anabus etc to be removed from the pond for table purposes.	Prevent influx of diseased fish from outside source, Check through nets Administer medicines through random catch Disinfect water by lime, KMnO4.	Application of lime and KmnO4. Assessment of the health status of fish and accordingly control measure should be taken. Control on transport of brooders and seeds. Application of CIFAX @ 1Lit/ha.
Cyclone			
Overflow/ Flooding of ponds	Increase in pond height, Provision of Swiss gate	To allow excess water through Swiss gate	Repair of ponds and dike
Change in fresh/brackish water ratio	Plantation crops in the bundh to be entangles with cross bamboo.	Disinfect water by lime, KMnO4	Application of CIFAX @ 1Lit/ha.
Health and diseases management	Prophylactic measures to be taken	Excess water drain out, Provision of good aeration	Farm and water treatment with lime and medicine
Heat wave and cold wave			
Management of pond environment	Good water quality to be maintained, Water depth to be maintained	Recirculation of water and pruning	Water treatment with lime
Health and diseases management	Prophylactic measures to be taken	Maintain good quality water in ponds	Treatment of pond water with lime and medicines



ORISSA STATE MAP



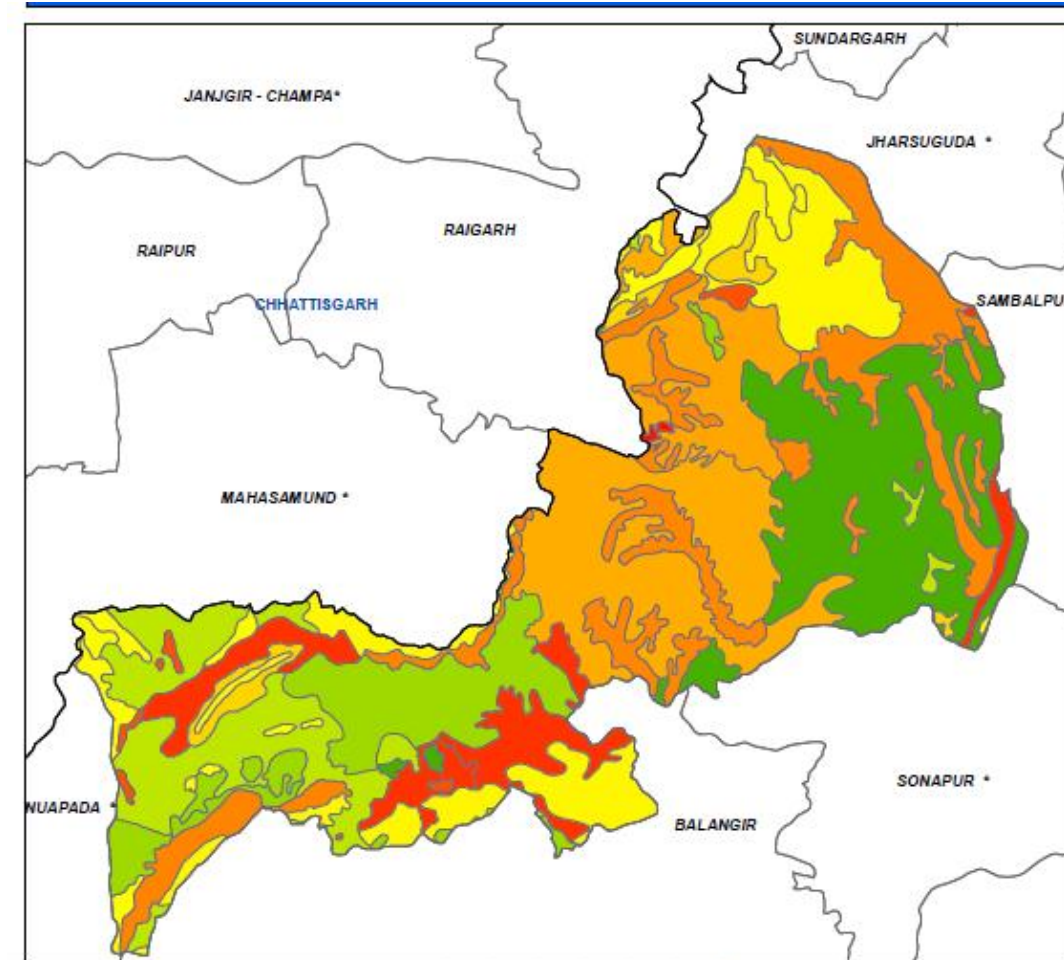
ANNEXURE-I

BARGARH DISTRICT MAP

ANNEXURE-II

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
Mean annual rainfall (mm)	12.5	19.1	22.0	20.0	25.6	205.6	397.2	374.4	222.6	52.8	10.4	5.1	1367.3
No. of rainy days(No.)	0.8	1.5	1.6	1.6	1.8	8.9	16.0	14.9	10.1	3.1	0.6	0.4	61.3

ANNEXURE – III



SOIL MAP OF BARGARH DISTRICT