



REPORT
ON
AGRICULTURE CONTINGENT PLAN
OF
PURI DISTRICT

KRISHI VIGYAN KENDRA, PURI
SAKHIGOPAL

Orissa University of Agriculture & Technology
Bhubaneswar – 751003

State: ODISHA

Agriculture Contingency Plan

District: PURI

1.0 District Agriculture Profile			
1.1	Agro-Climatic/Ecological Zone		
	Agro Ecological Sub Region (ICAR)	Utkal Plain and East Godavari Delta, Hot Dry Sub-humid Eco Sub-Region (18.4)	
	Agro-Climatic Region (Planning Commission)	East Coast Plain and Hill Region (11)	
	Agro Climatic Zone (NARP)	East and South Eastern Coastal Plain Zone (OR-4)	
	List all the districts falling under the NARP Zone	Kendrapara , Khurda, Jagatsinghpur, parts of Cuttack, Puri, Nayagarh and part of Ganjam	
	Geographic coordinates of district	Latitude	Longitude
	Source: SREP of Puri district	19 ⁰ 20' – 29 ⁰ 35' North	34 ⁰ 28' – 36 ⁰ 25' East
			Altitude
			Sea Level
	Name and address of the concerned ZRS/ZARS/RARS/RRS/RRTTS	Regional Research and Technology Transfer Station, Orissa University of Agriculture and Technology, Bhubaneswar- 751003	
	Mention the KVK located in the district with address	KVK, Puri, At: Adaptive Research Station, Sakhigopal, Post:- Sakhigopal, Dist: Puri (Odisha) PIN: 752014	
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Bhubaneswar (50 kms from the KVK)	
1.2	Rainfall	Average (mm)	Normal onset (specify week and month)
	SW monsoon (June-Sep):	1021.1	3 rd week of June
	NE Monsoon (Oct-Dec):	255.3	2 nd week of October
	Winter (Jan-Feb):	36.3	4 th week of January
	Summer (March-May):	96.1	4 th week of March
			Normal Cessation (Specify week and month)
			Last week of Sept
			Last week of December
			3 rd week of February
			2 nd week of May

	Annual	1408.8		
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Source: Orissa Agriculture Statistics, 2013-14

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)	348	14	115	9	3	9	8	95	1

1.4	Major Soils	Area ('000 ha)	Percent (%) of total
	1. Alluvial (Soil)	156.837	45.07
	2. Acidic Soil	120.791	34.71
	3. Saline Soil	20.190	5.80
	4. Laterite soil	2.471	0.71
	5. Other soils	47.711	13.71
	Total	300.289	86.29

Source: SREP of Puri District

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	94	217
	Area sown more than once	109.69	
	Gross cropped area	203.69	

Source: Orissa Agriculture Statistics, 2018-19

Irrigated area (potential created)

Major and medium		Minor flow		Minor (lift)				Other sources		Total	
				LI point		Deep bore well					
Kharif	rabi	Kharif	Rabi	Kharif	rabi	Kharif	rabi	Kharif	rabi	Kharif	rabi
116.166	74.160	0.859	0.090	30.720	17.687	1.030	0.206	20.980	15.026	169.755	107.169

Source: Orissa Agriculture Statistics, 2013-14

	Sources of Irrigation	Number	Area ('000 ha)	% area
	Canals		93.22723	73.39
	Tanks			
	Open wells			
	Bore wells/ dug wells		7.066	5.56
	Lift irrigation	297	11.192	8.81
	Other sources		15.543	12.23
	Total		127.02823	
	Pump sets	1101		
	Micro-irrigation			
Source: SREP of Puri District				
	Groundwater availability and use	No.of Blocks	% area	Quality of water
	Over exploited			

	Critical			
	Semi-critical			
	Safe	11 Blocks	30	Safe
	Waster water availability and use			

1.7 Area under major field crops & horticulture etc.2018-19

	Field crops-	Total area ('000 ha)	Yield rate (kg/ha)	Production ('000MT)
1	Paddy	120.15	3475	417.47
2	Black gram	19.41	506	9.82
3	Green gram	25.08	501	12.57
4	Groundnut	6.71	1987	13.33
5	Field pea	0.13	800	0.10
6	Gram	0.02	837	0.02
7	Sesamum	0.56	341	0.19
8	Sun flower	0.27	1185	0.32
9	Mustard	0.87	450	0.39
Source: Orissa Agriculture Statistics, 2018-19				
	Horticulture crops-Fruits	Total area ('000 ha)	Yield rate (kg/ha)	Production ('000MT)
1	Coconut	3.89	-	-

2	Mango	2.46	-	-
3	Banana	0.41	-	-
4	Citrus	0.02	-	-
5	Sapota	0.12	-	-
6	Guava	0.08	-	-
7	Papaya	0.01	-	-
8	Pineapple	0.02	-	-

Source: Orissa Agriculture Statistics, 2013-14

	Horticulture crops-Vegetables	Total area ('000 ha)	Yield rate (kg/ha)	Production ('000MT)
1	Potato	0.45	14400	6.48
2	Sweet potato	0.09	8333	0.75
3	Chilli	0.32	969	0.31
4	Coriander	0.34	529	0.18
5	Onion	0.23	9565	2.20
6	Ginger	0.02	4500	0.09
7	Turmeric	0.05	4800	0.24
8	Garlic	0.17	3529	0.60
9	Other vegetable	13.02	11260	146.61
10	Total vegetables	13.79	11315	156.04

Source: Orissa Agriculture Statistics, 2013-14

Sl.no	Fodder crops (ha.)	Total area
1	Total fodder crop area	250
2	Grazing land	11, 000

Source: Annual report of CDVO office, Puri, 2014-15

1.8	Livestock	Number		
	Total Cattle	443855		
	Buffaloes	16483		
	Pig	1427		
	Goat	132413		
	Sheep	44437		
1.9	Poultry	Number		
	Total birds in farm	975430		
	Backyard	91989		
	Total poultry	1067419		
	Source:19thLivestock census, 2012			
1.10	Inland Fisheries	Area (ha)	Yield (t/ha)	Production (tones)
	Brackish water	2411.15	7.91	19080.28
	Fresh water	7102.26	3.42	24314
	Others (Marine)	155 km coast line		43394.28

Source: SREP, 2007-08

Resources of tanks / ponds (Area in ha)

GP tanks		Revenue tanks		Private tanks		Total	
No	Area	No	Area	No	Area	No	Area
2802	1113.47	215	170.76	12493	2209.31	15510	3493.34

Source: Disaster management plan of Puri District, 2013-14

1.11	Sowing window for 5 major crops (Start and end of sowing period)	Crop 1: <u>Rice</u>	2. <u>Black gram</u>	3: <u>Green gram</u>	4: <u>Groundnut</u>	5: <u>Horse gram</u>
	Kharif-Rainfed	2 nd week June to 2 nd week July	-	-	-	-
	Kharif-Irrigated	2 nd week June to 4 th week Aug	-	-	-	-
	Rabi-Rainfed	-	1 st week Nov to last week Nov	1 st week Jan to 2 nd week Feb	4 th week Oct to 2 nd week Nov	1 st week Nov to last week Nov
	Rabi-Irrigated	3 rd week Dec to 3 rd week Jan	-		2 nd week Jan to 1 st week Feb	

1.13	What is the major contingency the district is prone to	Regular	Occasional	None
	Drought	✓		
	Flood	✓		
	Cyclone		✓	
	Hail storm			✓
	Heat wave	✓		
	Cold wave			✓
	Frost			✓
	Sea water inundation	✓		
	Pests and diseases (Specify)			
	i)Rice Stem borer	✓		
	ii) Swarming caterpillar	✓		
	iii) Leaf folder			
	iv) Blast, Neck blast	✓		
	v) Brinjal fruit & shoot borer	✓		
	vi) Red palm weevil & Rhinoceros beetle	✓		
	vii)Tobacco caterpillar in Cabbage			
	viii) Thrips in chili	✓		
	ix) YMV in Okra	✓		

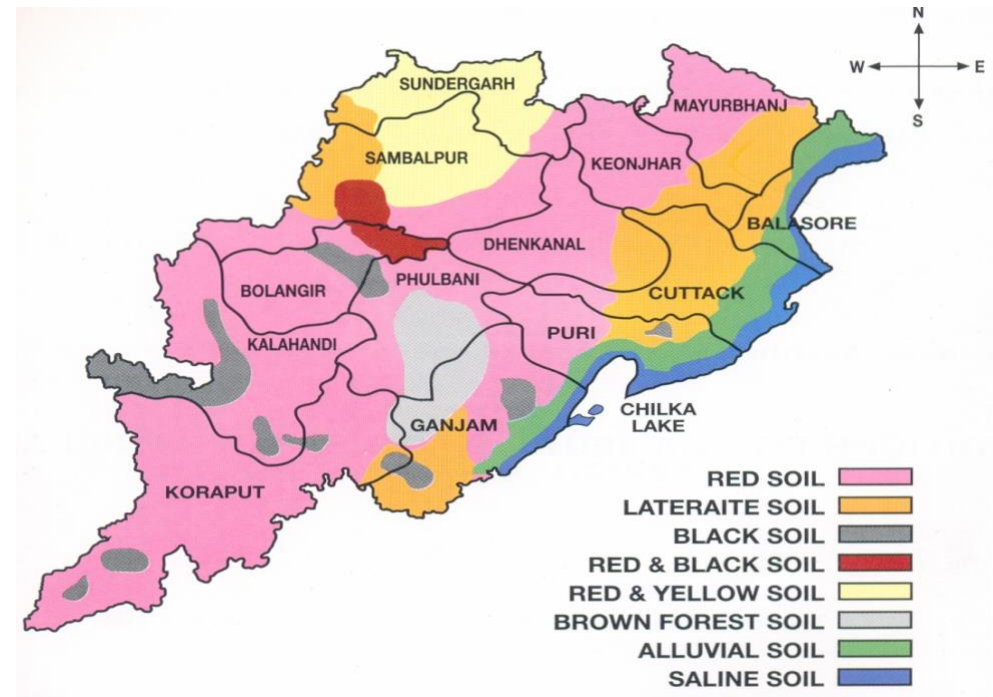
1.14	Include Digital maps of the district for		
		Location map of district with in State	Enclosed in the report
		Soil map	Enclosed in the report
		Month wise rain fall data	Enclosed in the report



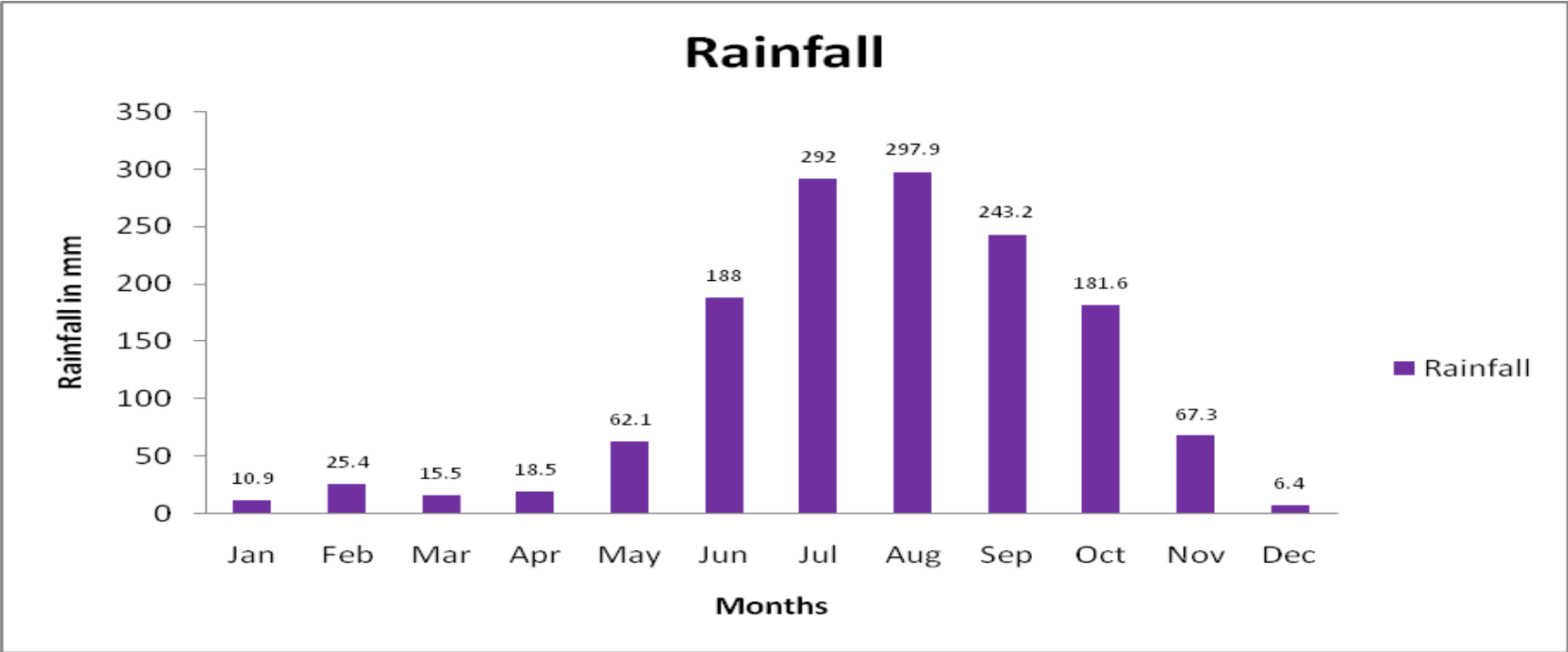
DISTRICT MAP OF PURI



SOIL MAP OF ORISSA



Month wise rainfall data



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	Crop/cropping system	Change in crop/cropping system including variety	Agronomic measures	Remarks on implementation
	Rainfed alluvium				
	1. Medium land	Rice-blackgram/green gram/horsegram Rice-groundnut/sesamum	Rice (var. Lalat, Naveen, MTU-1010, Swarna Sub-1, CR 1009 Sub-1, Pooja, Surendra, Konark, Jogesh) Blackgram (PU-30,35 10, 19,31,Sarala, Sashi, LBG-752) ,Greengram (PDM-11,54, Sujata, Durga, TARM 1, IPM 02-3), Horsegram(Urmee) Groundnut (Smruti,Devi, TMV-2) Sesamum (Uma, Prachi)	Line sowing of pre germinated paddy seeds using drum seeder. Delay nursery sowing.	Seed village (Pulse & Paddy), NFSM (Pulse), RKVY, OSSC, NSC
	2.Low land	Rice-greengram	Rice (CR 1009 Sub-1, CR-1018, CR-505,CR-500 Pooja, CR-1014, Sarala, Varshadhan, Durga, CR-1009 <i>sub1</i> , MTU-1210,	Delay nursery sowing	Seed village (Pulse & Paddy), NFSM (Pulse), RKVY,OSSC

			1224, RNR- 15048, MTU-1155, 1156) Green gram (IPM-02-14, Virat, Sikha)		
	Coastal alluvial saline	Rice-fallow	Rice (Luneeshree, Lunasampada, Lunasuvarna, Luna Sankhi), Sunflower(KBSH-1, Hybrids) after harvest of rice.	i. Addition of organic matter ii. Green manuring iii. Gypsum application iv. Zinc application v. Provide irrigation as much as possible.	Seed village, RKVY, OSSC
	Coastal waterlogged alluvium	Rice-fallow Fallow	Rice(Swarna sub-1, CR 1009 Sub-1, Kalachampa, Maudamani, MTU-1224,1210)	Early sowing/transplanting	RKVY, OSSC
	Flash flood Paddy	Paddy	Swarna <i>sub-1</i> , CR 1009 Sub-1, Kalachampa, Maudamani, mtu-1155, 1156, Hasanta	<ul style="list-style-type: none"> • Early sowing • Transplanting of 45 days old seedlings at closer spacing. 	
Condition				Suggested Contingency measures	
Early season drought (delayed onset)	Major farming situation	Crop/cropping system	Change in crop/cropping system including variety	Agronomic measures	Remarks on implementation
Delay by 4weeks (specify month) July 3 rd week	Rainfed alluvium				
	1. Medium land	Rice-blackgram/ Greengram/ horsegram Rice-groundnut/ sesamum	- Relatively shorter duration varieties like Lalat, Naveen, MTU-1010, Surendra, Hasanta Konark, Jogesh ,Bina-11, 12	<ul style="list-style-type: none"> • If rice population is less than 50% resow the sprouted seeds in line through pre-germinated seed drill or fresh seedlings. • Select short to medium duration varieties (90-120days) • Nursery raising in wet bed or sprouted seed sowing 	Seed village, RKVY, OSSC

				<ul style="list-style-type: none"> • Raise community nursery • Water in ponds, reservoirs & water bodies are to be utilized for raising seedling • Apply full dose of P, K and 50% N as basal with FYM for early seedling vigour. • Planting more number of seedlings per hill • Closer spacing • SRI method of rice transplanting/use of rice transplanter • Do not apply N in nursery 	
	2.Low land	Rice-greengram	Rice varieties like Swarna, Pratikshya, Pooja, Ranidhan, Mrunalini	<ul style="list-style-type: none"> ➤ If rice population is more than 50% carryout weeding and maintain the plant population by <i>Khelua</i> operation ➤ Water in ponds, reservoirs & water bodies are to be utilized for raising seedling ➤ Community nursery ➤ Planting of more number of seedlings per hill ➤ Closer spacing ➤ Application of nitrogen after rainfall ➤ Apply full dose of P& K as basal. 	-do-
	Coastal alluvial saline	Rice-fallow	Rice (Luneeshree, Lunasampad, Lunasubarna and Luna barial)	<ol style="list-style-type: none"> i. Addition of organic matter ii. Green manuring iii. Gypsum application iv. Zinc application v. Provide irrigation 	-do-

	Coastal waterlogged alluvium	Rice-fallow Fallow	Rice(Swarna <i>sub-1</i> , CR 1009 Sub-1, Kalachampa, MTU-1155)	-Community nursery -Planting of more number of seedlings per hill -Closer spacing	-do-
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Condition				Suggested Contingency measures	
Early season drought (delayed onset)	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Rain fed alluvium				
Delay by 6weeks (August 1 st week)	1. Medium Land	Rice-blackgram/ Greengram/ horsegram Rice-groundnut/ sesamum	Lalat, Surendra, Konark,MTU-1010,Naveen,Maudamani	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in medium land rice regularly. • Increase the height of bunds. • Withhold N fertilizer • Raise community nursery • Other sources of water is to be utilized for raising nursery. • Transplanting of 45 days old seedlings at closer spacing. • Water management by alternate wetting and drying technology 	Seed village, Tractor, power tiller, rotavator under RKVY

	2. Low land	Rice-greengram	Paddy (Swarnasub-1, Pratikshya, CR 1009 Sub-1), Greengram- (IPM-12-04, Virat)	<ul style="list-style-type: none"> • If rice population is less than 50% , resow the sprouted seeds in line through drum seeder or pre-germinated seed drill. • The farmers should go for clonal transplanting to maintain uniform plant population, in case of seedling damage in patches under submergence condition. • Farmers should go for double aged transplanting technique, which should be adopted, in case the main field is not prepared for timely transplanting due to flooding. • In case of transplanting of rice, 35-40days old seedlings are more tolerant to flood stress rather than the 21 days old seedlings. • In case of complete damage of paddy seedlings due to flooding, one can go for re-transplanting on the same field. • Efficient drainage lines and water harvesting Structures should be constructed. 	Seed village, Tractor, power tiller, rotavator under RKVY
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				<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss. • Withhold N fertilizer application till receipt of rainfall. • Follow need based plant protection measures against stem borer and blast. • Use tractor, power tiller, rotavator for speedy land preparation. • Follow close planting of 4-5 seedlings per hill. • Apply full P, K and 50 % N at the time of transplanting. • Apply life saving irrigation as and when necessary. 	
	Coastal alluvial saline	Rice-fallow	Rice (Luishree,Lunasampad, Lunasuvarna and Luna Sankhi)	<ul style="list-style-type: none"> • Transplanting of older seedlings of 45-60 days • Close planting of 5 seedlings/hill • Apply full P, K and 50 % N at the time of transplanting • Addition of organic matter • Green manuring • Gypsum application • Zinc application • Provide irrigation 	Seed village, RKVY, OSSC
	Coastal waterlogged alluvium	Rice-fallow	Rice(Swarna sub-1, CR 1009 Sub-1, MTU-1155, 1156)	<ul style="list-style-type: none"> -Community nursery -Planting of more number of seedlings per hill 	-do-

		Fallow	Boro rice cultivation (Var. Lalat, Chandan, Konark, Naveen, Khandagiri and BINA-11,12)	-Closer spacing -Broadcasting of rice after recession of water.	
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Condition				Suggested Contingency measures	
Early season drought (delayed onset)	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Rainfed alluvium				
Delay by 8 weeks (August 3 rd week)	1. Medium land	Rice-blackgram/ Greengram/ horsegram Rice-groundnut/ sesamum	Lalat, Surendra, Konark	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss in direct sown medium land rice regularly. • Withhold N fertilizer application till receipt of rainfall. • Provide life saving irrigation. • Weed incorporation through cono weeder. • Remove the pest and disease infected plants from the field. 	RKVY, Seed village scheme ,OSSC
	2. Low land	Rice	Swarna, Swarna <i>sub-Pratikshya</i> , Ranidhan, Kalachampa	<ul style="list-style-type: none"> • Close the drainage hole and check the seepage loss. • Increase bund height. • Withhold N fertilizer application till receipt of rainfall. • Transplant seedlings up to 45-60 days old. 	Tractor, power tiller, rotavator under RKVY

				<ul style="list-style-type: none"> • Follow plant protection measures against stem borer and blast in nursery. • Use tractor, power tiller, Rotavator for speedy land preparation. • Follow close planting of 4-5 seedling per hill. • Apply full P, K and 50 % N at the time of transplanting. • Apply life saving irrigation. 	
	Coastal alluvial saline	Rice-fallow	Rice (Luishree, Lunasampad, Luna Suvarna, Luna Sankhi, Luna Barihal)	<ul style="list-style-type: none"> • Transplanting of older seedlings of 45-60 days • Close planting of 5 seedlings/hill • Apply full P, K and 50 % N at the time of transplanting • Addition of organic matter • Green manuring • Gypsum application • Zinc application • Provide irrigation 	RKVY, Seed village scheme, OSSC
	Coastal waterlogged alluvium	Rice-fallow	Rice(Swarna sub-1, CR 1009 Sub-1, MTU-1155, 1156)	Community nursery Planting of more number of seedlings per hill Closer spacing	RKVY, Seed village scheme
		Fallow	Boro rice cultivation (Var. Lalat, Chandan, Konark, Naveen, Khandagiri)	Broadcasting of rice after recession of water.	

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

Condition			Suggested Contingency measures		
Early season drought (Normal onset)	Major farming situation	Crop/cropping system	Crop Management	Soil nutrient & moisture conservation measures	Remarks on implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Rainfed alluvium 1. Medium land	Rice-blackgram/ Greengram/ horsegram Rice-groundnut/ sesamum	Varietal substitution with Lalat, Manaswini, Naveen, Bejeta, MTU 1010, Konark, Jogesh and Surendra -If rice population is less than 50% resow the crop. - Sprouted seeds may be direct seeded or fresh seedlings may be raised for transplanting.	-Plugging of drainage hole for checking seepage loss and to provide life saving irrigation as and when necessary. -water in ponds reservoirs and water bodies are to be utilized	<ul style="list-style-type: none"> Supply of seed drills and intercultural implements through RKVY. Good quality seeds through OSSC.

			<ul style="list-style-type: none"> - If the rice population is more than 50%, carry out weeding and adjust the plant population by Khelua and clonal propagation. - Raise community nursery of rice at a reliable water source to save time for further delay. 		
	2. Low land	Rice	<ul style="list-style-type: none"> - Varietal substitution with Swarna, Pratikshya, Rani dhan, Sidhanta and Mahsuri - If rice population is less than 50% gap filling may be done - Sprouted seeds may be direct seeded or fresh seedlings may be raised for transplanting. - If the rice population is more than 50%, carry out weeding and adjust the plant population by Khelua and clonal propagation. - Raise community nursery of rice at a reliable water source to save time for further delay. 	<ul style="list-style-type: none"> - Sow the seeds at 3-5 cm depth by punji method (10-15 seeds) at one point, cover it with a mixture. FYM:SSP (10:1) to avoid seedling mortality due to moisture stress in low land. - plugging of drainage hole for checking seepage loss and to provide life saving irrigation as and when necessary. - water in ponds reservoirs and water bodies are to be utilized, 	Good quality seeds through OSSC.
	Coastal alluvial saline	Rice-fallow	<ul style="list-style-type: none"> - Varietal substitution with Rice var. Luishree, Lunasampad, Lunasuvarna - If rice population is less than 50% gap filling may be done. - Sprouted seeds may be direct seeded or fresh seedlings may be raised for transplanting. - If the rice population is more than 50%, carry out weeding and adjust 	<ul style="list-style-type: none"> - Provide irrigation - Use FYM/organic matter. - Green leaf manuring. - Application of zinc. - Application of zypsum. 	CLDP, IWMP, NREGS, ISOPOM & NFSM

			the plant population by Khelua and clonal propagation. - Raise community nursery of rice at a reliable water source to save time for further delay.		
	Coastal waterlogged alluvium	Rice-fallow	-Varietal substitution with Rice var.Swarna <i>sub-1</i> , Varsadhan, Hasanta -If rice population is less than 50% gap filling may be done - Sprouted seeds may be direct seeded or fresh seedlings may be raised for transplanting. - If the rice population is more than 50%, carry out weeding and adjust the plant population by Khelua and clonal propagation. - Raise community nursery of rice at a reliable water source to save time for further delay.	-Sow the seeds at 3-5 cm depth by punji method (10-15 seeds) at one point, cover it with a mixture. FYM:SSP (10:1) to avoid seedling mortality due to moisture stress in low land. -plugging of drainage hole for checking seepage loss and to provide life saving irrigation as and when necessary. -water in ponds reservoirs and water bodies are to be utilized,	-do-

Condition	Suggested Contingency measures				
Mid season drought (long dry spell, consecutive 2 weeks rainless (> 2.5 mm period))	Major farming situation	Crop/cropping system	Crop Management	Soil nutrient & moisture conservation massues	Remarks on implémentation
At vegetative stage	Rainfed alluvium				
	1. Medium land	Rice-blackgram/ Green gram/ horsegram Rice-groundnut/	- Do not practice Beushaning if the crop is more than 45 days old, - weed out the field.	- Strengthen the field bunds, close the drainage holes and check the seepage loss in direct	CLDP, IWMP, NREGS, ISOPOM & NFSM

		sesamum	<ul style="list-style-type: none"> - Use seedling of same age of clonal tillers for gap filling to have a uniform distribution of plant after rain. - 45 days old seedling can be transplanted in case of medium duration varieties - Follow close transplanting using 5-7 seedlings per hill. 	<p>sown medium land rice regularly.</p> <ul style="list-style-type: none"> - Apply 50% recommended N at the time of transplanting. - Top dress after receipt of rainfall. 	
	2.Low land	Rice	<ul style="list-style-type: none"> -Do not practice beushaning -Weed out the field -Follow plant protection measures -Transplanting of 60-70 days old seedlings - Closer transplanting using 5-7 seedlings per hill. 	<ul style="list-style-type: none"> -Provide protective irrigation through harvested rain water -Withhold N application -Strengthen the field bunds, close the drainage holes and check the seepage loss 	
	Coastal alluvial saline	Rice-fallow	-do-	<ul style="list-style-type: none"> -Withhold N application -Strengthen the field bunds, close the drainage holes and check the seepage loss - Provide irrigation - Use FYM/organic matter. - Green leaf manuring. - Application of zinc. - Application of Gypsum 	
	Coastal waterlogged alluvium	Rice-fallow	<ul style="list-style-type: none"> -Weed out the field -Follow plant protection measures 	<ul style="list-style-type: none"> -Provide protective irrigation through harvested rain water -Withhold N application -Strengthen the field bunds, close the drainage holes and check the seepage loss 	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	Major farming situation	Crop/cropping system	Crop Management	Soil nutrient & moisture conservation massues	Remarks on implémentation
At reproductive stage					
	1. Medium land	Rice	Harvest the crop at physiological maturity	<ul style="list-style-type: none"> - Check drainage, seepage loss. - Provide irrigation at critical stages such as panicle initiation, flowering, grainfilling. - Provide life saving irrigation. - Raise the height of bunds. - Recycling of rainwater. - Seed treatment with CaCl₂. - K & B application before flowering. - Provide irrigation at critical stages such flowering, grain filling. 	CLDP, IWMP, NREGS, ISOPOM & NFSM
	2. Lowland	Rice	-do-	-do-	
	Coastal alluvial saline	Rice	-do-	-do-	
	Coastal waterlogged alluvium	Rice	-do-	-do-	

Condition	Major farming situation	Crop/cropping system	Suggested Contingency measures		Remarks on implementation
			Crop Management	Rabi crop planning	
	Rainfed alluvium				
	1. Medium land	Rice	Provide life saving irrigation, harvest the crop at physiological maturity stage	-do-	
	2. Low land	Rice	-do-	- Grow green gram(PDM-11,54,K-851,Durga, TARM-1, TARM-2) black gram(PU-19,30,31,T-9,Sarala) - Paira cropping with greengram, blackgram.	NFSM,RKVY
	Coastal alluvial saline	Rice	-do-	Grow sunflower (KBSH-1)	-do-
	Coastal waterlogged alluvium	Rice	-do-	Grow green gram(PDM-11,54,K-851,Durga, TARM-1, TARM-2, IPM-02-14, Virat, Sikha) black gram(PU-10,19,30,31,T-9,Sarala) - Paira cropping with greengram, blackgram	-do-

2.1.2. Drought-Irrigation Situation

Condition				Suggested Contingency measures	
Delayed/limited release of water in canals due to low rainfall	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Coastal irrigated alluvium				
	1. Medium land	Rice /vegetables	Grow relatively shorter duration paddy vars (Lalat, Manaswini, Naveen, Bejeta, MTU 1010, Konark, Jogesh and Surendra) Pulse crops (Green gram PDM-11,54, PDM-139, K-851,Durga,TARM-2, ipm-02-14) , Black gram (PU-19,30,31,T-9,Sarala), Cow pea(SEB – 2, Utkal Manik), Horse gram(Urmee) Vegetables like Brinjal(Hajari-10, Blue star, Okra(Utkal gaurav), Chilli(U. Ava, U.Rashmi)	<ul style="list-style-type: none"> - Planting of older seedlings - More no. of seedling/hill. - Apply 50% N at basal - Raise nursery by dapog method - Other sources of irrigation. - Check conveyance loss. - Growing of short duration varieties. - Nitrogen application after release of canal water. 	Irrigation through tanks. RKVY, NFSM
	2. Lowland	Rice	Grow relatively shorter duration paddy vars (Pratikshya,Rani dhan, Sidhanta and Mahsuri)	<ul style="list-style-type: none"> Planting of older seedlings - More no of seedling/hill - Apply 50% N at basal - Raise nursery by dapog method 	

Condition				Suggested Contingency measures
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Non release of water in canals under delayed onset of monsoon in catchments	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Coastal irrigated alluvium				
	1. Medium land	Rice, Vegetables	Rice varieties like Surendra, Lalata. Vegetables like Brinjal(Hajari-10,Blue star), Okra(Utkal Gaurav)	<ul style="list-style-type: none"> - Use of ground water. - Rain water harvesting. - Irrigation at critical stages. - Application of K & B. - Application of Zinc. 	RKVY, ATMA
	2. Lowland	Rice	Use of rice varieties Swarna, Pratikshya	<ul style="list-style-type: none"> - Use of ground water. - Rain water harvesting. - Irrigation at critical stages. - Application of K & B. - Application of Zinc. 	-do-

Condition				Suggested Contingency measures	
Insufficient groundwater recharge due to low rainfall	Major farming situation	Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on implementation
	Coastal irrigated alluvium				
	1. Medium land	Rice, Vegetables	No change	<ul style="list-style-type: none"> - Use of other sources of water. -SRI method of planting - Irrigation at critical stages -Addition of organic matter - Use of Anti transpirants like PMA/ Kaoline. - Repair of field bunds to check seepage loss - Harvest at physiological maturity. 	RKVY, ATMA,NFSM
	2.Low land	Rice	No change	-do-	
Any other condition					
Water submergence during maturity stage due to untimely release of water in canals	Coastal irrigated alluvium Medium land and low land	Rice	No change	<ul style="list-style-type: none"> - Provide drainage channel. - Raise the bund dyke to prevent water entry to the field. - Make side channels for release of excess water. 	

2.2 Unusual rains (Untimely, unseasonable etc) (for the both rainfed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Crop 1 Rice	<ul style="list-style-type: none"> - Provide drainage - K application @ 10 kg/ha after cessation of rain - N application to be stopped - Spraying of Chloropyriphos @ 0.02% to control leaf folder. - Application of Chloropyriphos dust around the field bund, spraying of Chloropyriphos @ 3.5 ml/lit of water. 	<ul style="list-style-type: none"> - Provide drainage - K application @ 10 kg/ha after cessation of rain - Application of Chloropyriphos dust around the field bund, spraying of Chloropyriphos @ 3.5 ml/lit of water. 	<ul style="list-style-type: none"> - Provide drainage - Make alleyway - Harvesting at physiological maturity - Spraying of chemical to check sprouting - Application of Chloropyriphos dust around the field bund, spraying of Chloropyriphos @ 3.5 ml/lit of water. 	<ul style="list-style-type: none"> - Cover the produce. - Sun drying of the grains & keep the moisture level to < 14% - Application of EDB ampoules to control rice weevil & Angoumis grain moth during storage.
Crop 2 Pulses (Greengram, Blackgram, Horsegram)	<ul style="list-style-type: none"> - Provide drainage - Spraying of 2% DAP 	<ul style="list-style-type: none"> - Provide drainage 	<ul style="list-style-type: none"> - Provide drainage - Harvest the produce & carry to safer place & keep the produce spreading 	<ul style="list-style-type: none"> - Cover the produce. - Sun drying of the grains & keep the moisture level to < 14% - Application of Neem oil/ Mustard oil @ 3 ml/kg of seed, Dried leaves of Neem, Begunia to control pulse beetle during storage.
Crop 3 Oilseeds	<ul style="list-style-type: none"> - Provide drainage - Fertilizer to be applied after cessation of rain. 	<ul style="list-style-type: none"> - Provide drainage 	<ul style="list-style-type: none"> - Provide drainage - Harvesting & carrying to safer place & keep the produce spreading 	<ul style="list-style-type: none"> - Cover the produce. - Sun drying of the grains & keep the moisture level to < 14%

(Groundnut, Mustard, Sesamum)				- Polythene lined bags should be used to prevent from moisture absorption during storage.
Horticulture				
Crop 1 Coconut	- Provide drainage - Heaping around the plant - Spraying of Malathion @ 0.02 % to control leaf eating caterpillar.	- Provide drainage - Cleaning of the planting site - Heaping around the plant	- Provide drainage - Heaping around the plant	-
Crop 2 Mango	- Provide drainage - Heaping around the plant -Application of 75gm nitrogen, 110 gm. of P and 55gm. K per plant	- Provide drainage - Heaping around the plant - Spraying of endosulfan @ 0.02% to control mango hoppers	_ Harvesting must be done immediately	- Harvested fruits are kept in a well ventilated room wrapping with banana leaves.
Crop 3 Banana	- Provide drainage - Heaping around the plant - Spraying ridomil-M-Z(25gm) & Steptocycline(1.5gm) per 10 liters of water to avoid wilt	- Provide drainage. - Heaping around the plant. - Spraying ridomil-M-Z(25gm) & Steptocycline (1.5gm) per 10 liters of water to avoid wilt	- Provide drainage - Heaping around the plant -Harvesting should be done immediately	- Harvested fruits are kept in a well ventilated room wrapping with banana leaves.
Crop 4 Cauliflower	- Provide drainage - Spraying of Malathion @ 0.02 % at 10-15 days intervals to control aphid, caterpillar. - Spraying ridomil-M-Z(25gm) & Streptocycline (1.5gm) per 10 liters of water to avoid wilt	- Provide drainage. - Heaping around the plant. - Spraying ridomil-M-Z(25gm) & Steptocycline (1.5gm) per 10 liters of water to avoid wilt	- Provide drainage - Harvesting should be done immediately	Produce must be shifted to a well ventilated godown & should be marketed as quickly as possible.

Crop 5 Okra	<ul style="list-style-type: none"> - Provide drainage. - Heaping around the plant. - Spraying of Imidachloprid @ 4ml/ 10 lits of water to control white fly. - Spraying ridomil-M-Z(25gm) & Streptocycline (1.5gm) per 10 liters of water to avoid wilt 	<ul style="list-style-type: none"> - Provide drainage. - Heaping around the plant. - Spraying of Endosulfan @ 0.02 % to control fruit borer of okra. - Spraying Pesticides like ridomil-M-Z(25gm) & Streptocycline (1.5gm) per 10 liters of water to avoid wilt 	<ul style="list-style-type: none"> - Provide drainage. - Heaping around the plant. - Spraying of Endosulfan @ 0.02 % to control fruit borer of okra. 	Produce must be shifted to a well ventilated godown & should be marketed as quickly as possible.
Crop 6 Brinjal	<ul style="list-style-type: none"> -Provide drainage. - Heaping around the plant. - Spraying Ridomil-M-Z(25gm) & Streptocycline (1.5gm) per 10 liters of water to avoid wilt - Spraying of endosulfan @ 0.05% to control epilachna beetle. - Spraying of 0.03 % methyl parathion to control mite. 	<ul style="list-style-type: none"> -Provide drainage. - Heaping around the plant. - Spraying Ridomil-M-Z(25gm) & Streptocycline (1.5gm) per 10 liters of water to avoid wilt - Spraying of Cartap Hydrochloride @ 0.02 % to control shoot & fruit borer. 	<ul style="list-style-type: none"> - Provide drainage. - Heaping around the plant. -Harvesting should be done immediately 	<ul style="list-style-type: none"> - Produce must be sold in the local market. - When huge amount is produced it should be transferred to well ventilated godown.
Heavy rainfall with high speed winds in a short span				
Crop 1 Rice	<ul style="list-style-type: none"> - Provide drainage - P & K application - Boron spray - Application of zinc - Application of Phospho Gypsum 	<ul style="list-style-type: none"> - Provide drainage - P & K application - Boron spray - Application of zinc - Application of Phospho Gypsum 	<ul style="list-style-type: none"> - Provide drainage - P & K application - Boron spray - Application of zinc - Application of Phospho Gypsum 	<ul style="list-style-type: none"> - Cover the produce. - Sun drying of the grains & keep the moisture level to < 14% - Application of Neem oil/ Mustard oil @ 3 ml/kg of

			- Spraying of chemical against sprouting	seed, Dried leaves of Neem, Begunia to control pulse beetle during storage.
Horticulture				
Crop 1 Coconut	- Provide drainage - Mounding of soil around the plant	- Provide drainage - Mounding of soil around the plant. - Cutting down of broken leaves, cleaning around base & manuring with 500gm urea, 1kg SSP, 500 gm Potash, 100 gm micronutrient/plant	- Provide drainage - Mounding of soil around the plant. - Cutting down of broken leaves, cleaning around base & manuring with 500gm urea, 1kg SSP, 500 gm Potash, 100 gm micronutrient/plant & harvesting should be done	Cutting down of broken leaves, cleaning around base & manuring with 500gm urea, 1kg SSP, 500 gm Potash, 100 gm micronutrient/palnt & harvesting should be done
Crop 2 Mango	- Provide drainage - Heaping around the plant - Staking of young plants -Application of 75gm nitrogen, 110 gm. of P and 55gm. K per plant	- Provide drainage - Heaping around the plant	Harvesting must be done immidiately	Harvested fruits are kept in a well ventilated room wrapping with banana leaves.
Crop 3 Banana	- Provide drainage - Mounding of soil around the plant. - Propping should be done, cutting of the broken parts, cleaning of plantation site, manuring with 60gm urea, 120gm potash	- Provide drainage - Mounding of soil around the plant. - Propping should be done, cutting of the broken plant parts, cleaning of plantation site	- Provide drainage - Mounding of soil around the plant. - Harvesting should be done immediately, cutting of the broken plant parts, cleaning of plantation site	-
Crop 4 Cauliflower	- Provide drainage - Removal of damaged seedlings, heaping should be done around the seedlings,	- Provide drainage - Removal of damaged plant	- Provide drainage - Mounding of soil around the plant.	Produce must be kept in a well ventilated room and should be marketed as soon as possible.

	- Gap filling must be done.	- Heaping should be done around the plant	- Harvesting should be done immediately, removal of damaged plant.	
Crop 5 Okra	- Provide drainage - Mounding of soil around the plant. - Removal of damaged seedlings - Gap filling must be done.	- Provide drainage - Mounding of soil around the plant. - Cleaning of the field, Spraying of Bavistin 0.2 % + Steptocycline 0.001 % - Manuring should be done	- Provide drainage - Mounding of soil around the plant. - Harvesting should be done immediately, - Cleaning of the field, Spraying of Bavistin 0.2 % + Steptocycline 0.001 %	Produce must be kept in a well ventilated room and should be marketed as soon as possible.
Crop 6 Brinjal	- Provide drainage - Removal of damaged seedlings, heaping should be done around the seedling - Gap filling must be done.	- Provide drainage - Cleaning of the field, Spraying of Bavistin 0.2 % + Steptocycline 0.001 % to control wilt. - Spraying Cartap Hydrochloride @ 0.02 % to control shoot & fruit borer	- Provide drainage Harvesting should be done immediately, Spraying of Bavistin 0.2 % + Steptocycline 0.001 % to control wilt.	Produce must be kept in a well ventilated room and should be marketed as soon as possible.
Outbreak of pests and diseases due to unseasonal rains				
Crop 1 Rice	- To control stem borer & leaf folder, spray the crop with Triazophos/ Profenphos @2ml/ltr. of water. - To control sheath blight spray, Hexaconazole @ 2.5ml/ltr - To control blast spray with Tricyclazole @ 0.6gm/ltr	- To control stem borer & leaf folder spray the crop with Triazophos/ Profenphos @2ml/ltr. of water. - To control sheath blight spray, Hexaconazole @ 2.5ml/ltr	- Spraying of Imidachlopid/Thiomethoxam @ 4ml/10 lit of water to control BPH. - To control swarming caterpillar field bunds should be dusted with Chloropyrophos @ 25 kg/ha, spraying with Chloropyrophos @ 0.035 % in the evening hours.	- Cover the produce. - Sun drying of the grains & keep the moisture level to < 14% -Application of EDB ampoules to control rice weevil & Angoumis grain moth during storage.

	- To control swarming caterpillar field bunds should be dusted with Chloropyrophos @ 25 kg/ha, spraying with Chloropyrophos 1.5%DP@ 25 kg/hand spraying of (Chloropyrophos + cypermethrin)@ 5ml/lt in the evening hours.	- To control blast spray with Tricyclazole @ 0.6gm/lt - To control swarming caterpillar field bunds should be dusted with Chloropyrophos @ 25 kg/ha, spraying with Chloropyrophos 1.5%DP@ 25 kg/hand spraying of (Chloropyrophos + cypermethrin)@ 5ml/lt in the evening hours.		
Crop 2 Greengram, Blackgram	Spray neem formulation @ 5ml/lt. when population of aphids is low or, dimethoate @ 2ml/lt. or imidachlopid/ Thiomethoxam @ 1ml/4lt. of water when population is high	Spray neem formulation @ 5ml/lt. when population of aphids is low or, dimethoate @ 2ml/lt. or imidachlopid/ Thiomethoxam @ 1ml/4lt. of water when population is high Spray mancozeb @ 0.3% against cercospora leaf spot	Spray neem formulation @ 5ml/lt. when population of aphids is low or, dimethoate @ 2ml/lt. or imidachlopid @ 1ml/4lt. of water when population is high. Spray mancozeb @ 0.3% against cercospora leaf spot	- Cover the produce. - Sun drying of the grains & keep the moisture level to < 14% - Application of Neem oil/ Mustard oil @ 3 ml/kg of seed, Dried leaves of Neem, Begunia to control pulse beetle during storage.
Horticulture				
Crop 1 Coconut	-	-Use Pheromone trap, application granular insecticides ,carbofuran3G mixed with sand to control	- Application granular insecticides mixed with sand to control red palm weevil & Rhinoceros beetle	

		red palm weevil & Rhinoceros beetle		
Crop 2 Mango	-Application of Trizophos to control leaf eating beetle	-Application of Trizophos to control leaf eating beetle - Application of Trizophos @ 0.02% to control leaf webber	-Application of poison bait trap(Methyl Eugenol with Malathion & gur) and pheromone trap -Spraying of Mancozeb @ 0.03% to control anthracnose	- Harvested fruits should be kept in a well ventilated room to avoid fruit rotting.
Crop 3 Banana	Panama wilt- Spraying insecticide like Ridomil-M-Z(25gm) & Steptocycline(1.5gm) per 10 liters of water to avoid wilt	Panama wilt- Spraying insecticide like ridomil-M-Z(25gm) & Steptocycline(1.5gm) per 10 litres of water to avoid wilt	Harvesting should be done immediately	Harvested fruits should be kept in a well ventilated room wrapping with banana leaves
Crop 4 Cauliflower	- Spraying of Profenophos 2ml /lt to control leaf eating caterpillar, Spraying of Blitox -50 (30gm) & Steptocycline(1.5gm) per 10 liters of water to control root rot. - Perform soil drenching to the base of the plant with a solution of Carbendazim (0.15%) & Streptocycline (0.015%) at 10DAP, 25 DAP, & 40 DAP coinciding with intercultural operation.	- Spraying of Profenophos 2ml /lt to control leaf eating caterpillar, Spraying of Blitox -50 (30gm) & Steptocycline(1.5gm) per 10 liters of water to control root rot. - Perform soil drenching to the base of the plant with a solution of Carbendazim (0.15%) & Streptocycline (0.015%) at 10DAP, 25 DAP, & 40 DAP coinciding with intercultural operation.	Harvesting should be done immediately	-
Crop 5 Okra	- Spraying of Trizophos 2gm/lt to control leaf eating caterpillar,	Spraying of Trizophos 2gm/lt to control leaf eating	Harvesting should be done immediately, spraying of	Spraying of Acetamaprid@ 0.3gm/lt to control YMV

	<p>YMV, Spraying of Blitox -50 (30gm) & Steptocycline(1 gm) per 10 litres of water to control wilt.</p> <p>- Perform soil drenching to the base of the plant with a solution of Carbendazim (0.15%) &Streptocycline(0.015%) at 10DAP, 25 DAP, & 40 DAP coinciding with intercultural operation.</p>	<p>caterpillar, YMV, Spraying of Blitox -50 (30gm) & Steptocycline(1 gm) per 10 litres of water to control wilt.</p>	<p>Acetamaprid@0.3gm/lt to control YMV</p>	
Crop 6 Brinjal	<p>Spraying of Trizophos 2gm/lt to control leaf eating caterpillar, epilachna beetle</p> <p>Spraying of Blitox -50 (30gm) & Steptocycline(1 gm) per 10 litres of water to control wilt.</p> <p>If total crop is damaged replace the crop & mix the soil with stable bleaching powder @15 kg /ha at the time of final land preparation & transplant the seedlings after 5-7 days.</p> <p>Seedling root dip for 15 min. in 0.015% Streptocycline or, 0.15% plantomycine.</p> <p>Perform soil drenching to the base of the plant with a solution of Carbendazim (0.15%) &Streptocycline(0.015%) at 10DAP, 25 DAP, & 40 DAP</p>	<p>Spraying of Trizophos 2gm/lt to control leaf eating caterpillar, epilachna beetle</p> <p>Spraying of Blitox -50 (30gm) & Steptocycline(1 gm) per 10 litres of water to control wilt</p>	<p>Harvesting should be done immediately,</p>	

	coinciding with intercultural operation.			
Cucurbits	-	Spray Ridomil MZ 0.15% against downy mildew	Spray Ridomil MZ 0.15% against downy mildew	-

2.3 Floods

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/partial inundation				
Crop 1 Rice	<ul style="list-style-type: none"> - Provide drainage - Raisedbed nursery - Raised dapog method of nursery to transplant wherever possible - Maintain a buffer nursery in the backyard/high land area to ensure adequate plant population in the field after flood damage 	<ul style="list-style-type: none"> - Provide drainage - If damage is > 50% retransplant rice crop - In partially damaged fields allow rice plants to stand upright - Do not go for Beushaning - Weed out rice field, make gap filling & top dress to boost the growth 	<ul style="list-style-type: none"> - Provide drainage - Apply N & K after recession of water - Management for swarming caterpillar & leaf folder 	<ul style="list-style-type: none"> - Provide drainage - Make alleyway - Harvesting & carrying to safer place & keep the produce spreading
Horticulture				
Crop 1 Coconut	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done 	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done - Manuring with 500 gm urea, 1 kg SSP & 1 kg MOP should be made 	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done - Manuring with 500 gm urea, 1 kg SSP & 1 kg MOP should be made 	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done - Manuring with 500 gm Urea ,1 kg SSP & 1 kg MOP should be made
Crop 2 Mango	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done - Staking in young plants 	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt. 	<ul style="list-style-type: none"> - Provide drainage -Mounding should be done 	<ul style="list-style-type: none"> - Provide drainage Harvesting must be done immediately

	- Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.			
Crop 3 Banana	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Harvesting must be done immediately
Crop 4 Cauliflower	- Raised bed planting. - Provide drainage -Mounding should be done - Gap filling should be done. - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Harvesting must be done immediately
Crop 5 Okra	- Raised bed planting. - Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Harvesting must be done immediately
Crop 6 Brinjal	- Raised bed planting. - Provide drainage -Mounding should be done	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and	- Provide drainage -Harvesting must be done immediately

	- Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.		Steptocycline 0.001 % to control wilt.	
Continuous submergence for more than 2 days	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Crop 1 Rice	- Provide drainage -If damaged again make fresh nursery - Broadcasting/ line sowing of sprouted seed of relatively short duration rice varieties in soft puddle	- Provide drainage - Transplant 40 to 65 days old seedlings after flood water recedes - Makeup plant population by transplanting clonal tillers detaching from the old clumps - Apply moderate dose of fertilizers - Reduce N application & apply recommended P & K as basal to increase flood resistance - Top dress N & K in flood affected areas if situation permits	- Provide drainage - Apply N & K after recession of water - If crop is completely damaged, incorporate & go for rabi crops	- Provide drainage - Make alleyway - Harvesting & carrying to safer place & keep the produce spreading
Horticulture				
Crop 1 Coconut	- Provide drainage	- Provide drainage drainage channel should be made, earthing up must be done	- Provide drainage drainage channel should be made, earthing up must be done	- Provide drainage - Drainage channel should be made, earthing up must be done
Crop 2 Mango	- Provide drainage -Mounding should be done - Staking in young plants - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done - Spraying with Ridomil-MZ 0.25 % and Steptocycline 0.001 % to control wilt.	- Provide drainage -Mounding should be done	- Provide drainage Harvesting must be done immediately
Crop 3 Banana	- Provide drainage	- Staking of the plants - Provide drainage	- Provide drainage - Staking of the plants	- Provide drainage.

	-Earthing up should be done, Spraying with Ridomil MZ @ 0.15% should be done to avoid wilt	-Earthing up should be done, Spraying with Ridomil MZ @ 0.15% should be done to avoid wilt	-Earthing up should be done, Spraying with Ridomil MZ @ 0.15% should be done to avoid wilt	- Earthing up should be done, Harvesting should be done immediately.
Crop 4 Cauliflower	<ul style="list-style-type: none"> - Raised bed system of planting - Provide drainage - Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomycin @ 1gm/lit of water should be done to avoid wilt - In case of partial damaged gap filling must be done. - In case of complete damage fresh nursery must be prepared 	<ul style="list-style-type: none"> - Provide drainage - Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomycin @ 1gm/lit of water should be done to avoid wilt 	<ul style="list-style-type: none"> - Provide drainage -Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomycin @ 1gm/lit of water should be done to avoid wilt 	Harvesting must be done
Crop 5 Okra	<ul style="list-style-type: none"> - Raised bed system of planting - Provide drainage -Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt - In case of partial damaged gap filling must be done. 	<ul style="list-style-type: none"> - Provide drainage - Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt 	<ul style="list-style-type: none"> - Provide drainage - Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt 	Harvesting must be done

Crop 6 Brinjal	<ul style="list-style-type: none"> - Raised bed system of planting - Provide drainage - Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt - In case of partial damage gap filling must be done. - In case of complete damage fresh nursery must be prepared 	<ul style="list-style-type: none"> - Provide drainage -Heaping should be done Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt 	<ul style="list-style-type: none"> - Provide drainage -Heaping should be done, Spraying with Dithane-M-45 @ 5gm along with Plantomicyne @ 1gm/lit of water should be done to avoid wilt 	Harvesting must be done
Sea water inundation	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Crop 1 Rice	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter - Green manuring -Application of gypsum -Application of zinc 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter - Green manuring -Application of gypsum -Application of zinc 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter - Green manuring -Application of gypsum -Application of zinc 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter - Green manuring -Application of gypsum -Application of zinc
Horticulture				
Crop 1 Coconut	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum
Crop 2 Mango	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum 	<ul style="list-style-type: none"> -Provide drainage - Addition of organic matter -Application of gypsum
Crop 3 Banana	<ul style="list-style-type: none"> -Provide drainage 	<ul style="list-style-type: none"> -Provide drainage 	<ul style="list-style-type: none"> -Provide drainage 	<ul style="list-style-type: none"> -Provide drainage

	- Addition of organic matter -Application of gypsum	- Addition of organic matter -Application of gypsum	- Addition of organic matter -Application of gypsum	- Addition of organic matter -Application of gypsum
Crop 4 Cauliflower	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum
Crop 5 Okra	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum
Crop 6 Brinjal	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum	-Provide drainage - Addition of organic matter -Application of gypsum

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

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Extreme event type				
Heat wave				
Crop 1 Rice	Provide irrigation	Provide irrigation	Provide irrigation	
Horticulture				
Crop 1 Coconut	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in pit	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in pit	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in pit	Sprinkling with water, Irrigation should be done

Condition	Suggested contingency measure			
	Extreme event type	Seedling/nursery stage	Vegetative stage	Reproductive stage
Crop 2 Mango	-Spraying with water -Irrigation(Pitcher/Drip) should be provided -Mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	-Spraying with water -Irrigation(Pitcher/Drip) should be provided -Mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	-Spraying with water -Irrigation(Pitcher/Drip) should be provided -Mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	-Sprinkling with water Irrigation should be done
Crop 3 Banana	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the pit	Sprinkling with water, Irrigation & mulching should be done
Crop 4 Cauliflower	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Harvesting must be done as early as possible, Spraying with water
Crop 5 Okra	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like	Harvesting must be done as early as possible, Spraying with water

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
	vermicompost, NADEP compost must be applied in the field	vermicompost, NADEP compost must be applied in the field	vermicompost, NADEP compost must be applied in the field	
Crop 6 Brinjal	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Spraying with water, Irrigation should be provided, mulching must be done at the base of the plant, organic manure like vermicompost, NADEP compost must be applied in the field	Harvesting must be done as early as possible, Spraying with water
Horticulture				
Frost				
Crop 1				
Crop 2				
Crop 3				
Crop 4				
Horticulture				
Crop 1				
Crop 2				
Crop 3				
Crop 4				
Hailstorm				
Crop 1				
Crop 2				
Crop 3				

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Extreme event type				
Crop 4				
Horticulture				
Cyclone				
Crop 1 Rice	<ul style="list-style-type: none"> - Provide drainage - P & K application - Application of phospho gypsum - If damaged make fresh nursery - Broadcasting/ line sowing of sprouted seeds of relatively short duration varieties 	<ul style="list-style-type: none"> - Provide drainage - Transplant with older seedlings with 5 to 7 seedling/ hill - Apply 50% N and full P & K at basal 	<ul style="list-style-type: none"> - Provide drainage - If crop is damaged incorporate and go for rabi crops 	<ul style="list-style-type: none"> - Provide drainage - If crop is damaged incorporate and go for rabi crops
Horticulture				
Crop 1 Coconut	<ul style="list-style-type: none"> - Provide drainage -Uproot the damaged seedlings - Gap filling - Staking of the seedlings 	<ul style="list-style-type: none"> - Provide drainage 	<ul style="list-style-type: none"> - Provide drainage -Clean the damaged parts -Apply 500 gm urea, 1 kg super phosphate, 500gm potash/ plant 	<ul style="list-style-type: none"> Clean the damaged parts - Apply 500 gm urea, 1 kg super phosphate, 500gm potash/ plant
Crop 2 Mango	<ul style="list-style-type: none"> - Provide drainage - Mounding around the plants - Gap filling - Staking of the seedlings - Planting of wind breaks around the orchad 	<ul style="list-style-type: none"> - Provide drainage - Mounding around the plants - Manuring the plants with 75gm. N, 110gm. P and 55 gm. K per plant 	<ul style="list-style-type: none"> - Provide drainage -Clean the damaged parts -Mounding around the plants 	<ul style="list-style-type: none"> - Provide drainage -Clean the damaged parts -Mounding around the plants

Condition	Suggested contingency measure			
	Seedling/nursery stage	Vegetative stage	Reproductive stage	At harvest
Extreme event type				- harvesting should be done
Crop 2 Banana	- Provide drainage -Uproot the damaged seedlings - Gap filling - Staking of the seedlings	- Provide drainage -Staking of the plant -Manuring with 60 gm urea, 120 gm potash along with vermicompost	- Provide drainage -Staking of the plant -Manuring with 60 gm urea, 120 gm potash along with vermicompost	Harvesting must be done as early as possible
Crop 3 Cauliflower	- Provide drainage -Uproot the damaged seedlings - Gap filling	- Provide drainage - Application of N&K @ 62.5 & 25 kg/ha respectively	- Provide drainage - Intercultural operation like cleaning, hoeing must be done	Harvest the crop immediately
Crop 4 Okra	- Provide drainage -Uproot the damaged seedlings - Gap filling	- Provide drainage - Application of N&K @ 56 & 45 kg/ha respectively	- Provide drainage -Intercultural operation like cleaning, hoeing must be done	Harvest the crop immediately
Crop 5 Brinjal	- Provide drainage -Uproot the damaged seedlings - Gap filling - Staking of the seedlings	- Provide drainage -Apply fertilizer in the field - Application of N&K @ 62.5 & 55 kg/ha respectively	- Provide drainage -Intercultural operation like cleaning, hoeing must be done	Harvest the crop immediately

2.5 Contingent Strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measure		
	Before the event	During the event	After the event
Drought			
Feed and fodder availability	- Awareness generation among farmers about management of feed & fodder	Feeding animal with enriched fodder, common salt mineral mixture at recommended level only with maintenance ration.	-Feeding schedule to be normal adequate maintenance, production and pregnancy growth ration.

	- Advise farmers to preserve forage as silago & UTPS (Urea treated Preserved Silage) , Encourage to produce to more cereal forage crops -Livestock insurance		-Availing insurance
Drinking water	Establish or renovate tube well & other source like Public vats.	Providing animals with ORS. Fill the vats with fresh, clean & cold water round then clock.	Proving clean water as per requirement of the animals.
Health and disease management	-Creating awareness among farmers about health care and disease controls - Preventive measure like mass vaccination, deworming, and Serological analysis of possible infection. Storage of sufficient medicine to take care of sunstroke/ hyperthermia, indigestion. Provision to be made for shade to animal house.	Providing shady, well ventilated housing, taking immediate step to check sunstroke, Diarrhea and other ailments of livestock in consultation with veterinary doctor.	Normal health care to be maintained
Floods			
Feed and fodder availability	-Storage of feed & fodder at safe place - Shifting of livestock to elevated place. -Awaring farmers about the care & management of animals during flood time.	Feeding the animals with maintenance ration only.	Normal ration as per the need of animals to be provided.
Drinking water	Renovation of tube well at the elevated places to make available the clean drinking water to animals	Arrangements to be made to make available the clean drinking water to animals round the clock during flood time.	Sufficient clean water to be made available as per requirement
Health and disease management	-Awareness to be made among farmers on management of outbreak of possible disease during flood time & health care. - Prevention of disease may be made by mass vaccination and deworming. Sufficient medicine must be stored on possible disease of livestock.	Farmers are to be supplied with medicines of disease like Diarrhea and other disease.	Provision for care ness disposal in to be made from preventing outbreak of contagious diseases, on health care doctors were to be consulted after receding of flood water.
Cyclone			

Feed and fodder availability	-Storage of feed & fodder at safe place - Shifting of livestock to elevated place.	Feeding the animals with maintenance ration only.	Normal ration as per the need of animals to be provided.
Drinking water	Renovation of tube well at the elevated places to make available the clean drinking water to animals	Arrangements to be made to make available the clean drinking water to animals round the clock during cyclone time.	Sufficient clean water to be made available as per requirement
Health and disease management	-Awareness to be made among farmers on management of outbreak of possible disease during cyclone. - Prevention of disease may be made by mass vaccination and deworming. Sufficient medicine must be stored on possible disease of livestock.	Farmers are to be supplied with medicines of disease like Diarrhea and other disease.	Provision for care ness disposal in to be made from preventing outbreak of contagious diseases, on health care.

Heat wave			
Shelter/environment management	<ul style="list-style-type: none"> - Provision should be made for willing fan in animal shed. - Plantation of shady trees round the animal house - Hanging wet gunny bags on the window to make the inner environment cool. Provide adequate ventilation so that inner temp to be maintained at 25°C - Before preparation of animal house, orientation to be made so that direct sunlight is prevented. - Providing green bed cover around the farm. - Awareness to be made on the shelter making of the animal shed to farmers well ahead. 	<ul style="list-style-type: none"> - Gunny bags to be made wett at the time of requirement/ as per need. - Fans should run round the clock to make the animal shed cool. - Shed should be will ventilated. 	Inner animal shed temperature should be maintained at 25' C as per requirement by running fan or wetting the gunny bags.

Health and disease management	- Awareness generation among farmers about management of feed & fodder - Advise farmers to preserve forage as silago & UTPS (Urea treated Preserved Silage) , Encourage to produce to more cereal forage crops	Feeding animal with enriched fodder, common salt mineral mixture at recommended level only with maintenance ration.	Feeding schedule to be normal adequate maintenance, production and pregnancy growth ration.`
Low temperature & cold wave	Preparation of night shelter	Provision of artificial heat by bulb and earthen chula	
Health and disease management	Prior deworming and vaccination with HS, FMD, BQ vaccine, provision of feed supplements, immune boosters	Ring vaccination of the area Monitoring of the diseased animals and treatment	

2.5.2 Poultry

	Suggested contingency measure		
	Before the event	During the event	After the event
Drought			
Shortage of feed ingredients	Arrangement should be made to store unconventional feed substitutes like dry leaf meal, DORBI Dehusked oil Rice Bran)	Poultry should be fed with the unconventional feed substitutes	Normal feeding of the poultry should be made.
Drinking water	Infrastructure to be created to check wastage of drinking water i,e provision of nipple drinkers	Clean, fresh and cold water to be provided to the birds through nipple drinkers to check/minimize wastage of drinking water.	Watering can be made by channels, nipple drinkers as per need by birds.
Health and disease management	-Awareness among farmers to be made on the health care and disease management of the birds. - Disposal pits should be made near the poultry farm.	- Keep watch on the health status of the birds or any casualty in the farm house. - Proper disposal of the dead birds should be made. - Keep the farm cool, well ventilated.	Regular check up of health of birds to be done by a Veterinary doctor to avoid any further diseases.

	<ul style="list-style-type: none"> - Vaccination and deworming should be made as preventive. - Adequate medicines should be kept to deal with any emergency situation. 	- Don't change the litter in the house populated with birds to check dusting problem.	
Floods			
Shortage of feed ingredients	Ensure procurement of feed ingredients/compound feed sufficient ahead as feed supply to the farm will hamper due to submergence of the connecting roads	supply the compound feed to poultry farm under submergence area	Supply will continued till the situation is under control
Drinking water	protect water sources from submergence	Attempt will be made to provide sanitized drinking water	water will be sanitized with bleaching powder or any water sanitizer
Health and disease 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 farm premises. Feeding antibiotics and deworming. Replace wet litter. Disinfection of sheds. Proper disposal of dead birds if any
Cyclone			
Shortage of feed ingredients	Procurement of feed	Supply the compound feed to the poultry farm under cyclone affected area	Supply will continued till the situation is normal/ control
Drinking water	-	Attempt will be made to provide sanitized drinking water	Water sources will be sanitized with bleaching powder or any water sanitizer

Health and disease management	Procurement of medicine and vaccines	Vaccination of birds against different diseases. Provision should be made for available of sanitized water	Water sources will be sanitized with bleaching powder or any water sanitizer
Heat wave			
Shelter/environment management	Pruning of big trees in the farm. Putting curtains on open sides of the shed. Procurement of electrical accessories. Providing shed to poultry houses. Providing proper ventilation	Attempt will be made for cooling of poultry shed by adapting different cooling methods. Thickness of litter should be reduced. Ventilation to the house should be increased by providing ceiling fans and exhaust fans	Provision should be made to ensure proper ventilation to the house
Health and disease management	Procurement of antistress drugs	Supplementation of the antistress drugs in drinking water. Vaccination with fowl pox	Vaccination of birds against RD / IBD
Winter & cold wave	Provision of gunny bags to prevent cold air	Artificial heat by bulbs	
Health and disease management (Avian influenza)	Removal of big trees from poultry farms Vaccination against RD Provision of immune boosters, hygiene, sanitation, clean food and water provision Awareness programme	Culling of birds, disinfection, monitoring	Vaccination against RD, immunoboosters, awareness programme Sero-surveillance for Avian influenza in the population

2.5.3 Fisheries / Aquaculture

	Suggested contingency measure		
	Before the event	During the event	After the event
Drought			
A. Capture			
Marine	-	-	-
Inland	-	-	-
i) Shallow water in ponds due to insufficient rains/inflows	<ul style="list-style-type: none"> - Restricted release of water from the reservoir. - Supplementary water harvest structures like pond and tanks has to be developed. Renovation and maintenance of existing water harvest structures - Species : (Indian Major Carps (IMC), i.e., Rohu, Mrigal and Catla + Exotic carps (Silver carp and Grass carp @ 5000 fingerlings/ha 	Application of rice bran + Groundnut oil cake + vitamins or 80 kg, urea + 40 kg SSP/ha/year: Raw cow dung @ 5 t/ha + micronutrient to enhance the production of phyto plankton and zoo plankton.	Using CIFAX @ 1 lit/ha or lime and turmeric powder 10:1 ratio applied @ 200 kg/ha during the month of November and January to control Ulcerative disease syndrome (UDS) and Epicortical ulcerative syndrome (EUS)
ii) Changes in water quality	<ul style="list-style-type: none"> - Prepare to release water into the habitat. - Leveling of farm bunds , testing of water body - Development high stocking density 	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
B. Aquaculture			
i) Shallow water in ponds due to insufficient rains/inflows	Building deep ditches in culture ponds for shelter of the fish to overcome high temperature	Recharge the ponds with bore well water or water from other sources Partial harvesting of the stock to reduce stocking density	-

	Suggested contingency measure		
	Before the event	During the event	After the event
		Artificial shelter by putting aquatic floating weeds in 1/3 rd area	
Impact of heat and salt load build up in ponds/change in water quality	Application of organic manure in culture system	Recharge the ponds with bore well water or water from other sources	Application of organic manure in culture system
Floods			
A. Capture			
Marine	-	-	-
Inland	-	-	-
i) Average compensation paid due to loss of human life	Construction of human shelter. Storage of sand filled bags for emergency use. Repair and maintenance of bundles. Preparedness for relief. Insurance coverage provision for life and property.	Timely broadcast and telecast and other types of announcement warning. about the danger level with respect to water level. Evacuation of people to flood shelter areas. Relief operation	Relief operation will continue. Care and health of affected people. Settlement of insurance. Financial support to other people.
ii) No of boats/ nets damaged	The boats have to be secured safely to river / reservoir banks. Non operation of fixed bag nets in streams and rivers. Insurance coverage for nets and boats	Checking of the safety of the boats/ nets. An inventory log books with name of crew members should be maintained. No. of crew and load should be much below the marked tonnage	Maintenance of boats and nets. Assessment and settlement of insurance
iii) No of houses damaged	Insurance coverage for houses	-	Settlement of insurance
iv) Loss of stock	-	-	Assessment of stock(fish population) and replenishment if stock is depleted. Habitat restoration for the stock remaining

	Suggested contingency measure		
	Before the event	During the event	After the event
v) Changes in water quality	-	-	Application of lime in tanks. Application of fertilizer.
vi) Health and diseases	-	-	Observation of health status of fish and accordingly control measures should be taken. Control on transport of brooders and seeds
B. Aquaculture			
i) Inundation with flood waters	Strengthening and increase in dyke height. This should be constructed with inlet and outlet facility	Net enclosure should be provided over the dyke to prevent the escape of fish from the pond	Repair and strengthening of dyke if required
ii) Water contamination and changes in BOD	Application of lime	-	Application of lime and geolite. Application of Alum. Application of KMnO ₄ .
iii) Health and disease management	Application of lime	-	Application of lime and KMnO ₄ . Assessment of health status of fish and accordingly control measure should be taken. Control on transport of brooders and seeds
Cyclone			
Overflow/flooding of ponds	Strengthening and increase in dyke height. This should be constructed with inlet and outlet facility.	Net enclosure should be provided over the dyke to prevent the escape of fish from the pond	Repair and strengthening of dyke if required
Change in fresh/brackish water ratio	-	-	-

	Suggested contingency measure		
	Before the event	During the event	After the event
Health and disease management			Application of lime and KMnO ₄ . Assessment of health status of fish and accordingly control measure should be taken. Control on transport of brooders and seeds
Heat wave and cold wave			
Management of pond environment	During hot waves adequate water depth should be maintained	During hot waves mixing water with fresh water should be done. The culture system should be provided with aeration to avoid oxygen depletion due to high temperature. Partial harvesting can be done to avoid loss.	-
Health and disease management	Application of lime and turmeric	Feeding should be stopped If cold wave persist EUS outbreak takes place	Application of CIFAX to control EUS disease in fish