

State: ORISSA

Agriculture Contingency Plan for District: BALASORE

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Gangetic Delta, hot moist, sub-humid eco-sub region (18.5)		
	Agro-Climatic Zone (Planning Commission)	East Coast Plains & Hills Region (XI)		
	Agro Climatic Zone (NARP)	North Eastern Coastal Plain Zone of Orissa (OR-3)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Jajapur, Bhadrak, Balasore		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		21 ⁰ 03 to 21 ⁰ 59'N	86 ⁰ 16' to 87 ⁰ 29'E	28.3m
	Source: District Stat. Hand Book, Balasore: 2005			
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRTTS, Ranital Balasore-756 001		
	Mention the KVK located in the district with address	KVK, Balasore, At/po- Devog, Via- Singla, Dist- Balasore-756 023		
Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RRTTS, Ranital			

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset	Normal Cessation
	SW monsoon (June-Sep):	1481	50	1 week of June	4 th week of September
	NE Monsoon(Oct-Dec):	10	10	1 st week of October	1 st week of November
	Winter (Jan- March)	89	05		
	Summer (Apr-May)	121	09		
	Annual	1701	74		

Source: Orissa Agriculture Statistics, 2008-09

1.3	Land use pattern of the district (latest statistics)	Geographical area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	381	234	33	33	16	9	25	10	34	5

Source: Orissa Agriculture Statistics, 2008-09

1.4	Major Soils (common names like red sandy loam deep soils (etc.,)*)		Area ('000 ha)	Percent (%) of geographical area of the zone.
	Saline		75.4	19.8
	Alluvial soils	i) Rain fed	98.1	26.0
		ii) Canal irrigated	22.6	5.9
		iii) Flood prone	90.5	23.9
	Red laterite soils	i) Rainfed	49.0	12.9
		ii) Canal irrigated	41.5	11.0

Source: SREP, Balasore

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	216	154
	Area sown more than once	117	
	Gross cropped area	333	

Source: Orissa Agriculture Statistics, 2008-09

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	177.53 (97.1 kharif + 80.3 Rabi)		
	Gross irrigated area	244.01 (138.9 kharif + 105.0 Rabi)		
	Rainfed area	146.3		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	3	20.8	8.5
	Tanks	35,624	5.6	2.3
	Open wells	-	-	-
	Bore wells	-	-	-
	Lift irrigation schemes	14,034	104.8	43
	Micro-irrigation	75	0.1	0.1
	Shallow tube well	2239	4.4	1.8
	Medium irrigation project	2	3.8	1.6
	MIP	32	6.0	2.5
	Other		98.1	40.2
	Total Irrigated Area		244.0	
	Pump sets	321		
	No. of Tractors	62		
Source: SREP and DAO, Balasore				

	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
	Over exploited	-		202 ha. Saline
	Critical	-		5 ha. Iron toxicity
	Semi- critical	5		
	Safe	7		
	Wastewater availability and use	1		
	Ground water quality		-	
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source: SREP, Balasore., Orissa Agric. Stat.2008-09.

1.7 Area under major field crops & horticulture (as per latest figures) (2008-09)

1.7	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total		
Paddy	84.3	127.1	211.4	34.1	-	34.1	-	245.5	
Groundnut	-	0.05	0.05	8.63	6.43	15.06	-	15.1	
Mung	0.01	0.06	0.07	5.12	2.4	7.52	-	7.5	
Biri	0.05	0.18	0.23	4.09	2.56	6.65	-	6.8	
Maize	0.05	0.27	0.32	0.08	-	0.08	-	0.4	

Source: Orissa Agricultural Statistics, 2008-09.

Horticulture crops – Fruits	Total Area ('000 ha)
Mango	4.39
Citrus	0.80
Papaya	0.06
Pineapple	0.04
Guava	0.32
Sapota	0.07
Horticulture crops - Vegetables	Total

Brinjal	10.22
Tomato	8.91
Chilli	3.97
Potato	0.11
Onion	1.01
Medicinal and Aromatic crops	Total
Aonla	0.02
Bacha	0.01
Brahmi	0.01
Plantation crops	Total
Banana	0.71
Coconut	1.13
Cashew nut	0.56
Fodder crops	Total
Perennial: Hybrid napier (CO1), paragrass, guinea grass, combo grass Annual:Maize (Kharif), oat, barley, berseem, Lucerne (Rabi)	0.04

	Total fodder crop area	0.04
	Grazing land	13.8
	Sericulture etc	0.02

Source: District veterinary Office, Balasore, Tassar Samiti, Nilagiri, Balasore

1.8	Livestock	Male ('000)	Female ('000)	Total ('000)
	Non descriptive Cattle (local low yielding)	443.7	409.7	853.5
	Improved cattle	11.0	24.4	35.5
	Crossbred cattle	-	-	-
	Non descriptive Buffaloes (local low yielding)	2.2	2.0	4.2
	Descript Buffaloes	-	-	-
	Goat	116.9	217.1	334.1
	Sheep	2.5	5.2	7.8
	Others (Camel, Pig, Yak etc.)	7.1	10.7	17.9
	Commercial dairy farms (Number)	69		
1.9	Poultry	No. of farms	Total No. of birds ('000)	
	Commercial	758	656.3	
	Backyard	76	353.4	

Source: Annual Report 2008, District. Veterinary Office, Balasore

1.10	Fisheries (Data source: Chief Planning Officer)						
	A. Capture						
	Marine (Data Source: Fisheries Department)	No. of fishermen	Boats		Nets		Storage facilities (Ice plants etc.)
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	
	85000	1561	652	1561	-	-	

	Inland (Data Source: Fisheries Department)	No. Farmer owned ponds	No. of Reservoirs	No. of village tanks
		110150	34	1925
B. Culture				
		Water Spread Area (ha)	Yield (t/ha)	Production ('000 tons)
	Brackish water (Data Source: MPEDA/ Fisheries Department)	1648.87	1.40	2.63
	Fresh water (Data Source: Fisheries Department)	3942.00	2.87	11.34
Source: Annual Report, 2008, District Fisheries Office, Balasore				

1.11 Production and Productivity of major crops (Average of last 5 years: 2004, 05, 06, 07, 08; specify years)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Paddy	415.01	1963	109.73	3220	-	-	524.74	2137	-
	Maize	0.37	1156	0.10	1205	-	-	0.47	1166	-
	Mung	0.04	515	3.20	425	-	-	3.24	426	-
	Biri	0.12	527	3.36	505	-	-	3.48	506	-
Others	Ground nut									
Major Horticultural crops (Crops to be identified based on total acreage)										
		Kharif		Rabi		Summer		Total		Crop residue

		Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	as fodder ('000 tons)
	Brinjal	293.4	30.0	14.0	31.5	-	-	307.4	30.06	-
	Tomato	10.2	20.0	252.0	30.0	-	-	262.2	29.42	-
	Chilli (dry)	1.4	0.853	2.1	0.934	-	-	3.5	0.899	-
	potato	-	-	1.2	11.279	-	-	1.2	11.279	-
	Onion	-	-	8.2	8.139	-	-	8.2	8.139	-

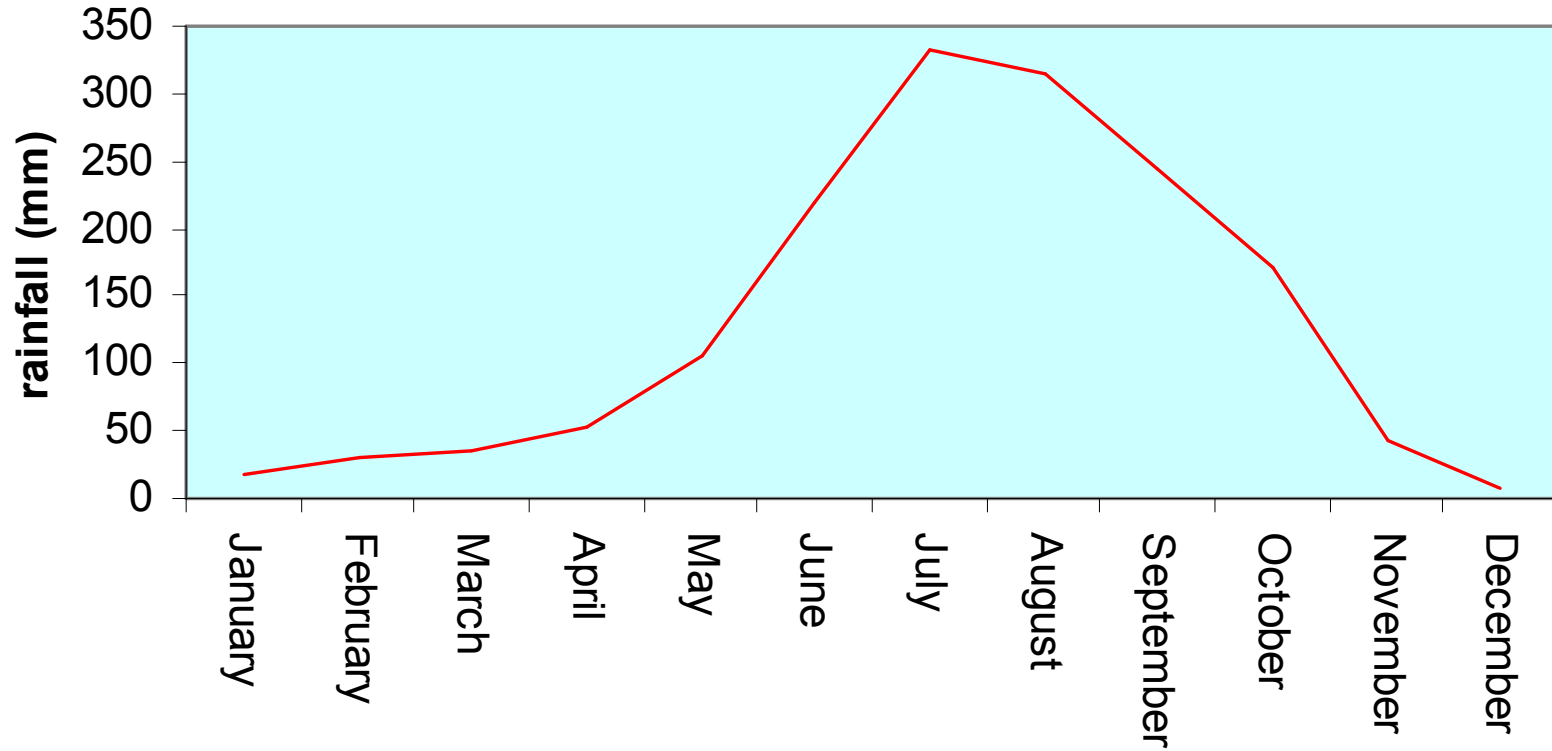
Source: Orissa Agric. Stat. 2008-09 and S.R.E.P., Balasore.

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Rice	Biri	Mung	Groundnut	Brinjal
	Kharif- Rainfed	2 nd week of May	4 th week of June	4 th week of June	2 nd week of June	1 st week of June
	Kharif-Irrigated	1 st week of June	-	-	4 th week of June	2 nd week of June
	Rabi- Rainfed	-	2 nd week of November	2 nd week of November	2 nd week of November	2 nd week of October
	Rabi-Irrigated	2 nd week of December	2 nd week of December	2 nd week of December	1 st week of December	1 st week of November-

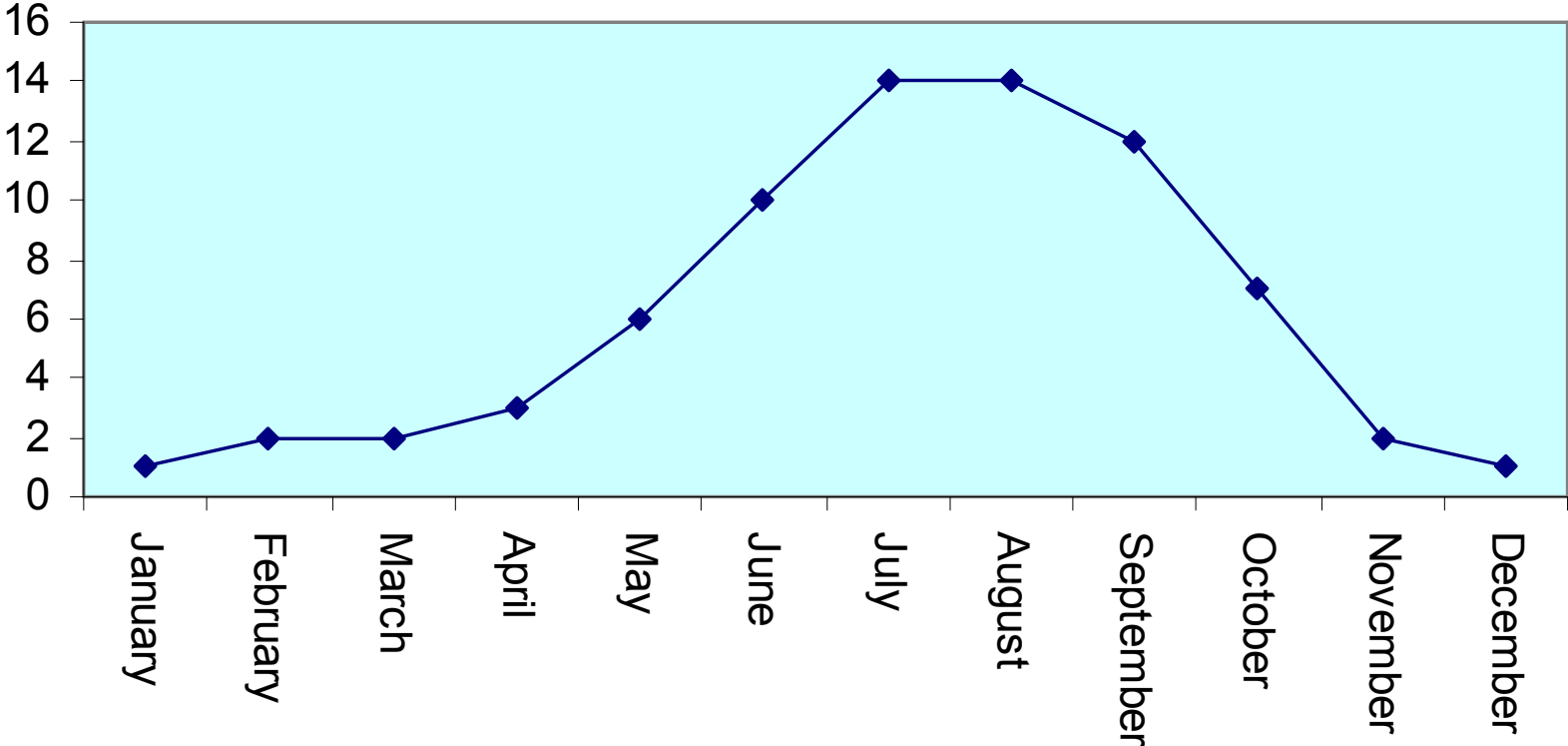
1.13	What is the major contingency the district is prone to? (Tick mark)	Regular	Occasional	None
	Drought	√	-	-
	Flood	√	-	-
	Cyclone	√	-	-
	Hail storm	-	√	-
	Heat wave	-	√	-
	Cold wave	-	√	-
	Frost	-	-	√
	Sea water intrusion	√	-	-
	Pests and disease outbreak (specify)	√	-	--
	Others (specify)	-	-	-

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

Monthwise normal rainfall of Balasore district



Monthwise normal rainy days of Balasore district



District Map of Balasore, Orissa

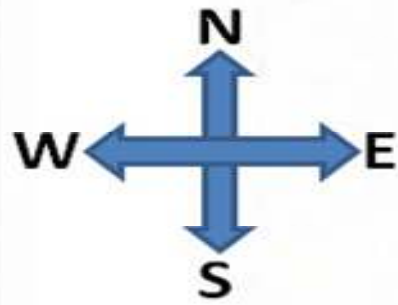
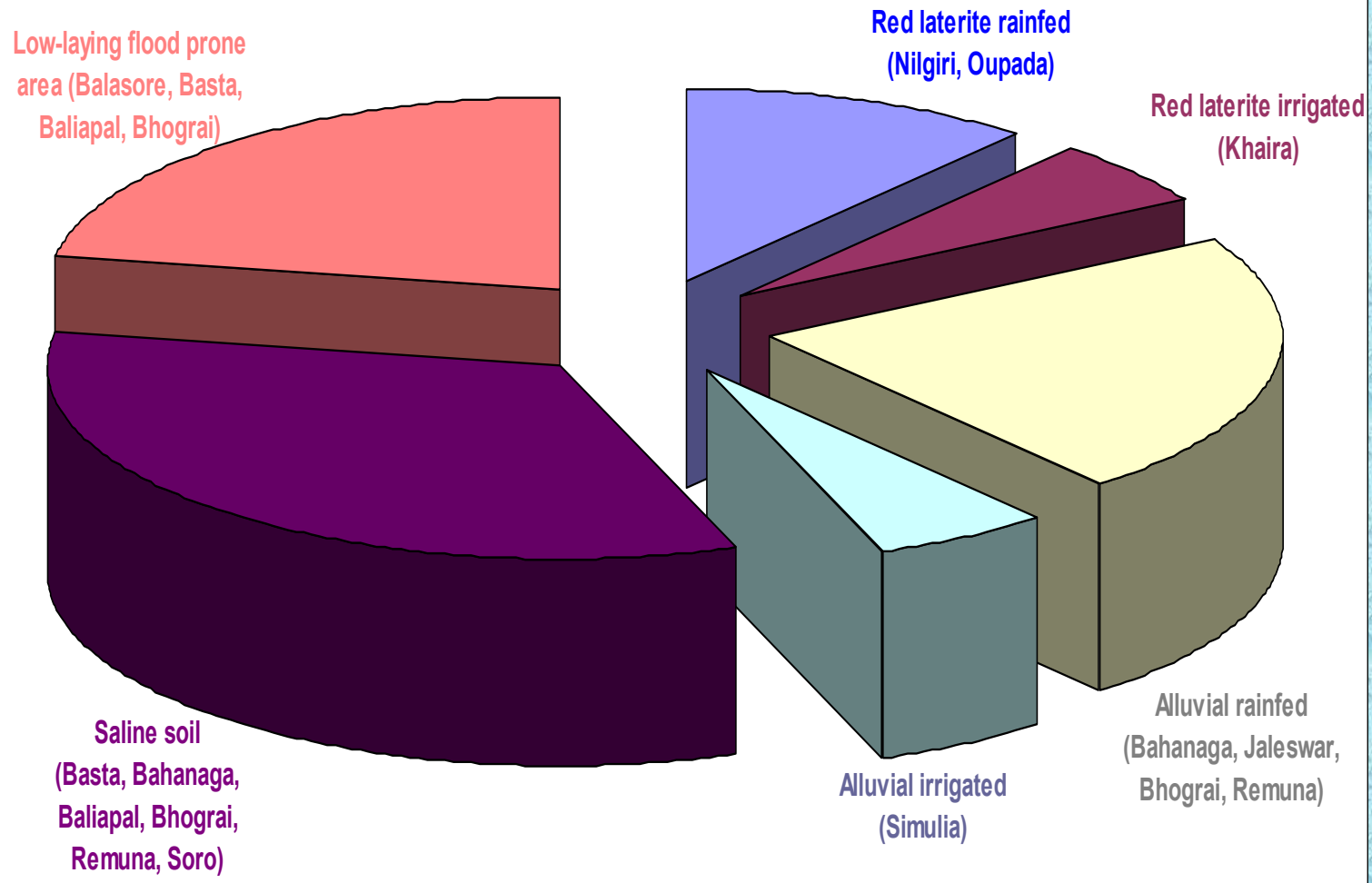


Fig. 3 Agro-ecological Situations of Balasore District



SOIL FERTILITY MAP OF BALASORE DIST.



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition	Major Farming situation	Normal Crop / Cropping system	Suggested Contingency measures		
			Change in crop / cropping system including variety	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 2 weeks (3rd week of June)	Laterite soils Uplands	Rice-fallow	Short duration, drought tolerant varieties suggested to grow as sole crop. Rice: (90-95 days duration): Kalinga-II, Khandagiri, Vandana, Pathara, Parijata, Ghanteswari, Anjali.	<ul style="list-style-type: none"> • Summer ploughing, land shaping, bunding, • Ridges and furrow methods of sowing with proper spacing • Conserving soil moisture, on farm water harvesting • Life saving irrigation, • Contour cultivation in sloppy areas • Closer row and plant spacing, • Apply full P, K and 20% N of recommended dose along with well decomposed organic matter for early seedling vigor, • Inter-cultivation and thinning to maintain plant population per unit area of the crop • Weed control 	<ul style="list-style-type: none"> • Seed drill under RKVY. • Supply of seeds through ATMA, OSSC and NFSM
			Greengram: PDM-11 & 54, Hum-1.		
			Blackgram: T-9, WBU-108, Sarala, pant-U-19, 30, 35		
			Sesamum Kanak, Prachi, Kalika, Usha		
	Alluvial soils in medium lands	Rice-fallow	Growing of Medium duration rice variety: Lalat, Swarna, Mahsuri. (120-135 days)	<ul style="list-style-type: none"> • Summer ploughing • Use of bulky organic manures • Ridges and furrow methods of sowing • Proper spacing • Transplanting rice • In-situ rain water conservation, 	
			Variety for growing of Lowland rice: Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree. (140-145 days duration)		

			Growing of short duration vegetable like cucumber, okra, Cowpea	harvesting of excess runoff for recycling and ground water recharge.	
	Coastal alluvial saline soils Lowland	Rice-fallow/Vegetables	<p>Lowland rice: Lunishree, Luna Sampad, Luna Suvarna, CSR-10, Sonamani, Tapaswani</p> <p>Vegetables : Sugarbeet, sweet potato</p>	<ul style="list-style-type: none"> • Summer ploughing • Use of bulky organic manures • Ridges and furrow methods of sowing • Proper spacing • Transplanting rice <p>In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.</p>	
	Flood prone area Lowland	Rice- Vegetable Fallow-Vegetable	<p>Lowland rice: Swarna Sub-1, Barsha, Kanchan, Ramachandi, Durga, Uphar, Sarala, Varshadhan for semi-deep low lands. are suggested for flash flood situations.</p> <p>Vegetable: Cucurbits, cole crops, solanaceous, greens, root crops.</p>	<ul style="list-style-type: none"> • If damage is more than 50% re-transplant rice crop of medium duration group. Dapog nursery for quick raising of seedling for replanting • In partially damaged fields, allow the rice plants to stand upright. Do not go for beushaning as it may further reduce the plant population. • Weed out the rice field, make gap filling and top dress N and K to boost the growth if situation permits. 	<ul style="list-style-type: none"> • Seed drill under RKVY. <p>Supply of seeds through ATMA, OSSC and NFSM</p>

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 4 weeks 1 st week of July	Laterite soils Upland	Rice-fallow	<p>Low water requiring crops like blackgram, greengram maize, groundnut, cowpea, pigeonpea etc. Double cropping in upland can be done through maize-horsegram/sesamum rotation.</p> <p>The legume based intercropping system like groundnut + pigeonpea, groundnut + blackgram, groundnut + greengram, groundnut + cowpea in the ratio of 4: can prove successful. Suitable non rice varieties in upland are:</p> <p>Maize (Hybrids) : Ganga-5, Daccan-103, KH 510, KH 101; Maize (Composites) Shakti-1, Novjyot.</p> <p>Groundnut: TMV-2, AK-12-24. Pigeonpea : UPAS-120, KPL 151, T21, KPH-8. Blackgram : T-9, PU30, Sarada. Greengram : PDM-54, 11 Horsegram : Urmi, Madhu. Sesame: Kanak, Konika, Gujarat-1.</p>	<p>Ridge and furrow methods of sowing may be adopted as in-situ soil moisture practices.</p> <p>Other measures like land shaping contour cultivation, field/ contour bonding can be adopted.</p>	Intercultural farm implements under RKVY. Seeds through NFSM, ISOPOM, NHM and state seed corporation (OSSC).
	Alluvial soils in medium lands	Rice-fallow	<p>Medium land rice: Lalat, Swarna, Masoori.</p>	<p>Nursery can be raised and that will be ready for transplanting after 21 days seedling.</p> <p>In-situ rain water conservation,</p>	

				harvesting of excess runoff for recycling and ground water recharge.	
	Coastal alluvial saline soils in lowland	Rice-fallow/vegetables	Lowland rice: Lunisee, Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree.(140-145 days duration) , Vegetables : Sugarbeet, Sweet potato	-Do-	
	Flood prone area Lowland	Rice- Vegetable	Lowland rice: Swarna Sub-1, Barsha, Kanchan, Ramachandi, Durga,Uphar, Sarala, Varshadhan for semi-deep low lands.are suggested for flash flood situations. Vegetable: Cucurbits, cole crops, solanaceous, greens, root crops.	-Do-	
		Fallow-Vegetable			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 6 weeks 3 rd week of July	Lateritic soils Uplands	Rice-fallow	Pulses like Cowpea, Blackgram, Greengram can be grown upto last week of July	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. In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM

				<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 manures is recommended.</p>	
	Alluvial soils Medium land	Rice-fallow	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.	<p>In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.</p> <p>Seed treatment and proper plant</p>	<ul style="list-style-type: none"> • Seed drill under RKVY. <p>Supply of seeds through ATMA, OSSC and NFSM</p>

		Vegetable-fallow	Growing short duration vegetable like cucumber, okra, Cowpea	<p>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>	
	Coastal alluvial saline soils Lowland	Rice-fallow	<p>Lowland rice: Lunisee, Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree (140-145 days duration) ,</p> <p>Vegetables : Sugarbeet, Sweet potato</p>	-Do-	
	Flood prone area Lowland	Rice- Vegetable	<p>Lowland rice: Swarna Sub-1, Barsha, Kanchan, Ramachandi, Durga,Uphar, Sarala, arshadhan for semi-deep low lands are suggested for flash flood situations.</p> <p>Vegetable: Cucurbits, cole crops, solanaceous, greens, root crops.</p>	-Do-	
		Fallow-vegetable			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Early season drought (delayed onset) Delay by 8 Weeks 1 st week of August	Lateritic soils Upland	Rice-fallow	Shifting from traditional crops/varieties to short duration low water requiring crops like cowpea, blackgram, green gram by substituting rice totally. If the main crop fails 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>rabi</i> season crop	The recommended dose of nitrogen application should be reduced by 40 % in rain fed 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.	Tractor, power tiller, rotavator under RKVY
	Alluvial soils Medium land	Rice-fallow	Shifting from traditional crops/varieties to short duration rice. Rice varieties like Lalat (120 days), Vandana (100-110 days) are useful in this situation. If the main crop fails 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.	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 rain fed 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.	
	Coastal alluvial saline soils Low land	Rice-fallow	Lowland rice: Lunisee, Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree.(140-145 days duration) , Vegetables : Sugarbeet, Sweet potato	-Do-	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Flood prone area Lowland	Rice- vegetable	Lowland rice: Swarna Sub-1, Barsha, Durga, Uphar, Sarala, Varshadhan for semi-deep low lands. are suggested for flash flood situations. Vegetable: Cucurbits, cole crops, solanaceous vegetables, greens, root crops.	-Do-	
		Fallow-vegetable			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Early season drought (Normal onset)					
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Lateritic soils Upland	Rice-fallow	In upland, rice will be damaged very quickly, result in poor crop stand. The land may be re-sown with low water requiring non-rice crops rather than allowing sub-optimal poor rice plant stand to persist. The field should be free of weeds for utilization of water and nutrients by the late sown crops	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.	• Supply of seed drills and intercultural implements through RKVY. Good quality seeds through NFSM and OSSC.
	Alluvial soils Medium land	Rice-fallow based	Direct seeded rice should be re-sown because 'sprouting drought' will damage substantial rice area. But re-	Strengthen the field and contour bunds for in-situ moisture conservation.	• Seed drill under RKVY. Supply of seeds

			<p>sowing of direct seeded rice should be avoided till sufficient rains have been received. Raising community nurseries of rice is recommended for transplanted rice.</p> <p>If sufficient good quality seed is not available, locally available seeds from adjoining areas should be used after proper germination check.</p> <p>Seeds treatment with Thiram or Captan @ 2-2.5 g/kg seed and other recommended plant protection measures.</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>	<p>through ATMA, OSSC and NFSM</p>
	Coastal alluvial saline soils	Low land rice-fallow	-Do-	<p>Strengthen the field and contour bunds for in-situ moisture conservation.</p> <p>Utilise already harvested rainwater as life saving or protective irrigation.</p>	<ul style="list-style-type: none"> • Seed drill under RKVY. <p>Supply of seeds through ATMA, OSSC and NFSM</p>
	Flood prone area	Low land rice-vegetable Fallow-vegetables	<p>The land may be re-sown 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 can help in risk minimization. This can be achieved by including a companion crop like greengram, cowpea than the main crops.</p>	<p>About 11-37 % run-off is generated even by the delayed monsoon and should be stored in the farm ponds or tanks.</p> <p>These will recharge ground water 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>	<ul style="list-style-type: none"> • Seed drill under RKVY. <p>Supply of seeds through ATMA, OSSC and NFSM</p>

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)					
At vegetative stage	Lateritic soils Upland	Rice-fallow	Thinning	<ul style="list-style-type: none"> • Mulching should be practiced in between crop rows using locally available mulch material. • In-situ rain water conservation, harvesting of excess runoff for re-use and ground water recharge. • Conserve rainwater by increasing bund height 	<ul style="list-style-type: none"> • Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Alluvial soils Medium land	Rice-fallow		<ul style="list-style-type: none"> • In-situ rain water conservation • Harvesting of excess runoff for re-use and ground water recharge. • Conserve rainwater by increasing bund height 	Small and marginal farmers may be employed under NREGA for creating rain water conservation and storage structures to enhance productivity of their limited land.
	Coastal alluvial saline soils Low land	Rice-fallow	-Do-	-Do-	
	Flood prone area Lowland	Rice- Vegetable Fallow-Vegetable	-Do-	-Do-	

Condition	Major Farming situation	Suggested Contingency measures			
		Normal Crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell) At flowering/ fruiting stage	Lateritic soils Upland	Rice-fallow	<ul style="list-style-type: none"> • Thinning • Providing life saving irrigation • Irrigate every alternate furrow on rotation. 	<ul style="list-style-type: none"> • Foliar application of fertilizers • Mulching should be practiced in between crop rows using locally available mulch material 	
	Alluvial soils Medium land	Rice-fallow	<ul style="list-style-type: none"> • Providing life saving irrigation from harvested rainwater. • Reduction of conveyance losses by spreading polythene sheet in the field channel before irrigating the field and then roll it back for irrigating the other field. 	<ul style="list-style-type: none"> • Foliar application of fertilizers • Mulching should be practiced in between crop rows using locally available mulch material 	
	Coastal alluvial saline soils Low land	Rice-fallow	-Do-	<ul style="list-style-type: none"> • Small and marginal farmers may be employed under NREGA for creating rain water conservation and storage structures for future drought. 	
	Flood prone area Lowland	Rice- Vegetable Fallow-Vegetable	<ul style="list-style-type: none"> • Irrigate every alternate furrow on rotation. • Life saving irrigation from harvested rainwater • Adoption of micro-irrigation to save water. 	<ul style="list-style-type: none"> • Mulching in between crop rows 	

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)	Lateritic soils Upland	Rice-fallow	<ul style="list-style-type: none"> • Life saving irrigation from harvested rainwater • Adoption of micro-irrigation to save water. 	<ul style="list-style-type: none"> • Mulching in between crop rows 	Small and marginal farmers may be employed under NREGA for creating rain water conservation and storage structures to enhance productivity of their limited land
	Alluvial soil Medium land	Rice-fallow	<ul style="list-style-type: none"> • Life saving irrigation from harvested rainwater • Adoption of micro-irrigation to save water. • Harvesting of rice at physiological maturity will realize 80-85% of normal yield. 	-Do-	
	Coastal alluvial saline soils Low land	Rice-fallow	-Do-	-Do-	
	Flood prone area Lowland	Rice- Vegetable Fallow-Vegetable	-Do- for kharif.	-Do-	

2.1.2 Drought - Irrigated situation

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Lateritic soils Upland	Rice-fallow	<ul style="list-style-type: none"> • Reduction of rice area during rabi season • Growing low water requiring oilseeds and pulses e.g. groundnut, green gram, black gram, sunflower, sesamum are preferred options. • Use of mid duration variety like 'Lalat' (120 days) is well suited in rabi. 	<ul style="list-style-type: none"> • Life saving irrigation with ground water 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. • Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield. • Rescheduling of irrigation roster is called upon to optimize use of depleted water Supplies and high demand. 	Desilting and construction of new conveyance system under different schemes like NREGA, BRGF, MPLAD, etc.
	Alluvial soils Medium land	Rice-fallow	Low water requiring oilseeds and pulses like groundnut, arhar, sunflower, sesamum are grown.	Same as above for kharif rice	
	Coastal alluvial saline soils Low land	Rice-fallow	<ul style="list-style-type: none"> • Growing of short duration legumes viz. cowpea, bean or root vegetables like radish during rabi seasons. 	Same as above for kharif rice.	
	Flood prone area Lowland	Rice- Vegetable Fallow-Vegetable	<ul style="list-style-type: none"> • Growing of short duration legumes viz. cowpea, bean or root vegetables like radish during rabi seasons. 		

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Lateritic soils	Lowland rice-rice	<ul style="list-style-type: none"> Rice area during rabi should be reduced. Use of mid duration variety like 'Lalat' (120 days) is well suited in rabi. Growing of low water requiring oilseeds and pulses viz arhar, groundnut, sunflower, sesamum 	<ul style="list-style-type: none"> Irrigate the kharif rice in the critical stages with groundwater during dry spells only Reduction of conveyance losses by using suitable irrigation method Harvesting of kharif rice at physiological maturity Irrigate the rabi rice at critical stages only with groundwater. Re-scheduling of irrigation roster is called upon to optimize use of depleted water 	
	Coastal alluvial saline soils	Lowland rice-vegetables	<ul style="list-style-type: none"> Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons. 	<ul style="list-style-type: none"> Same as above for kharif rice. 	
	Flood prone area	Lowland rice-vegetables Fallow - vegetables	<ul style="list-style-type: none"> Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons. 	<ul style="list-style-type: none"> Same as above for kharif rice. 	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Lateritic	Lowland Rice-Rice	<ul style="list-style-type: none"> Rice area during rabi should be reduced. Growing low water requiring Oilseeds and Pulses like groundnut, green gram, black gram, sunflower and sesamum 	<ul style="list-style-type: none"> Irrigate the kharif crops during dry spell with ground water. Irrigate the rabi rice at critical stages only with ground water. Reduction of conveyance losses while irrigating the crops. Harvesting of kharif rice at 	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				physiological maturity	
	Alluvial soils	Lowland rice- Oilseeds/Pulses	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Irrigate the kharif crops during dry spell with ground water. Harvesting of kharif rice at physiological maturity	
	Coastal alluvial saline soils	Lowland rice- Vegetables	Growing of short duration legumes like cowpea, bean or root vegetables like raddish during rabi seasons.	Irrigate the kharif crops during dry spell with ground water. Harvesting of rice at physiological maturity	
	Flood prone area	Lowland rice- Vegetables	-Do-	-Do-	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Lateritic soils Upland	Rice-fallow	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 crops during dry spell with ground water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Alluvial soil Medium land	Rice-fallow	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Irrigate the kharif crops during dry spell with ground water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	
	Coastal alluvial saline soils Low land	Rice-fallow	Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons	Irrigate the kharif crops during dry spell with ground water. Harvesting of kharif rice at physiological maturity	
	Flood prone area Lowland	Rice- vegetable	-Do-	-Do-	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Lateritic soils Upland	Rice-fallow	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 crops 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 should be stored in the farm ponds	

Condition	Suggested Contingency measures				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
				or tanks. These will recharge ground water 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.	
	Alluvial soil Medium land	Rice-fallow	Low water requiring oilseeds and pulses like groundnut, green gram, black gram, sunflower, sesamum	Irrigate the kharif crops during dry spell with harvested rain water. Harvesting of kharif rice at physiological maturity will realize 80-85% of normal yield.	
	Coastal alluvial saline soils Low land	Rice-fallow	Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons	Irrigate the kharif crops during dry spell with harvested rain water. Harvesting of kharif rice at physiological maturity.	
	Flood prone area Lowland	Rice- Vegetable	-Do-	-Do-	

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

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Continuous high rainfall in a short span leading to water logging				
Rice	Provide drainage	Provide drainage	Drain out excess water, harvest at physiological maturity	Shift the produce to half covered threshing floor and other safer places for post harvest operations and cover the crops to protect from moisture absorption.
Groundnut	-do-	-do-	-do-	-do-
Brinjal	-do-	-do-	-do-	-do-
Tomato	-do-	-do-	-do-	-do-
Cow pea	-do-	-do-	-do-	-do-
Lady's finger	-do-	-do-	-do-	-do-
Chilli	-do-	-do-	-do-	-do-
Heavy rainfall with high speed winds in a short span				
Outbreak of pests and diseases due to unseasonal rains				

2.3 Floods

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Rice	Maintaining nursery of over aged rice seedlings of 45 days to 60 days duration	Growing waterlogging resistant varieties like Durga, Sarala, Varshadhan and Hanseswari	Removal of stand from the field in case of stand deposition and planning for alternate crops like sweet potato under zero tillage	Wet seeding of short duration rice varieties (Heera (60 days), Kalinga –III (90 days)) or medium duration varieties (Lalat (120 days), Parijat (100 days) Wet seeding of short duration varieties (Heera (60 days), Kalinga –III (90 days)) or medium duration varieties (Lalat (120 days), Parijat (100 days), Konark (125 days), Surendra (135 days), pulses, vegetables during forthcoming rabi season.
Maize	-	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer.	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer.	Wet seeding of short duration rice varieties, pulses, vegetables during forthcoming rabi season.
Sugarcane	Drainage of excess water	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer and white fly.	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer and white fly.	Wet seeding of short duration rice varieties, pulses, vegetables during forthcoming rabi season.
Horticulture				
Banana	Immediate drainage of water is needed as it is highly susceptible to water logging	Immediate drainage of water		
Coconut	Basin repair to be done following flood withdrawal	Spray Naphthalene acetic acid @ 20 ppm to reduce the flower and fruit drop. Drain the water as early as	Spray NAA@200 ppm to prevent fruit drop	Storage in protected place against the storage pests.

		possible as flowering stage is critical to water logging.		
Continuous submergence for more than 2 days				
Rice	Maintaining nursery of over aged rice seedlings of 45 days to 60 days duration.	Growing waterlogging resistant varieties like Durga, Sarala, Varshadhan and Hanseswari	Removal of stand from the field in case of stand deposition and planning for alternate crops like sweet potato under zero tillage.	Wet seeding of short duration rice varieties (Heera (60 days), Kalinga –III (90 days)) or medium duration varieties (Lalat (120 days), Parijat (100 days) Wet seeding of short duration varieties (Heera (60 days), Kalinga –III (90 days)) or medium duration varieties (Lalat (120 days), Parijat (100 days), Konark (125 days), Surendra (135 days), pulses, vegetables during forthcoming rabi season.
Maize	Drain out excess water	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer.	Drain out excess water, spray the crop with Imidacloprid @ 3ml/10litre to check stem borer.	Wet seeding of short duration rice varieties, pulses, vegetables during forthcoming rabi season.
Sugarcane	Drainage of excess water	-Do-	-Do-	-Do-
Horticulture				
Banana	Immediate drainage of water is needed as it is highly susceptible to water logging	Immediate drainage of water		
Coconut	Basin repair to be done following flood withdrawal	Spray Naphthalene acetic acid @ 20 ppm to reduce the flower and fruit drop. Drain the water as early as possible as flowering stage is critical to water logging.	Spray NAA@200 ppm to prevent fruit drop	Storage in protected place against the storage pests.
Sea water intrusion				
Rice	Growing salt tolerant rice varieties like Lunishree			

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

Extreme event type	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave	NA	NA	NA	NA
Cold wave				
Kharif Vegetables		To minimize the adverse affect of weather, farmers have to irrigate their <i>rabi</i> vegetables and maize crops frequently		
Frost	NA			
Hailstorm	NA			
Cyclone	NA	-	-	-

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	As the district is frequently prone to drought the following practices may be implemented to prevent fodder shortage problem Sowing of cereals (fodder varieties of Sorghum/Bajra) and leguminous crops (Lucerne, Berseem, Horse gram, Cowpea) during rabi under dry land system for fodder production.	Harvest and use biomass of dried up crops (Paddy, Maize, Black gram, Groundnut, Green gram, Horse gram, cow pea, Sugarcane etc..) material as fodder Use of locally available cheap feed resources like GN haulms as supplement for feeding of livestock during drought	Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with input subsidy Supply of quality stem cuttings of Hybrid napier (CO1), paragrass, guinea grass, combo

	<p>Collection of groundnut haulms and groundnut cake for use as feed supplement during drought</p> <p>Motivating the sugarcane farmers to convert green sugarcane tops in to silage by the end of February</p> <p>Preserving the green maize fodder as silage</p> <p>Encourage fodder production with Bajra – stylo-Bajra on rotation basis and also to cultivate short-term fodder crops like sunhemp</p> <p>Formation of village Disaster Management Committee</p> <p>Capacity building and preparedness of the stakeholders and official staff for the drought/floods</p>	<p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of Horse gram as contingent crop and harvesting it at vegetative stage as fodder</p> <p>Continuous supplementation of minerals to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p>	<p>grass well before monsoon</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>Desilting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in shandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources</p> <p>Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater. Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and disease management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p>	<p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p>	<p>Keep close surveillance on disease outbreak.</p> <p>Undertake the vaccination depending on need</p> <p>Keep the animal houses clean and spray</p>

	<p>All the stock must be immunized for endemic diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Procure and stock multivitamins & area specific mineral mixture</p>	<p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p>	<p>disinfectants Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p>
Floods			
Feed and fodder availability	<p>In case of early forewarning (EFW), harvest all the crops (Paddy, Maize, Black gram, Groundnut, Green gram, Horse gram, cow pea etc.) that can be useful as feed/fodder in future (store properly)</p> <p>Protect the dried Dongri grass, sorghum stover etc., from inundation of flood water</p> <p>Keeping sufficient of dry fodder to transport to the flood affected villages</p> <p>Don't allow the animals for grazing if severe floods are forewarned</p> <p>Keep stock of bleaching powder and lime</p> <p>Carry out Butax spray for control of external parasites</p> <p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic</p>	<p>Transportation of animals to elevated areas</p> <p>Proper hygiene and sanitation of the animal shed</p> <p>In severe storms, un-tether or let loose the animals</p> <p>Use of unconventional and locally available cheap feed ingredients for feeding of livestock.</p> <p>Avoid soaked and mould infected feeds / fodders to livestock</p> <p>Carryout deworming to all animals entering into relief camps</p> <p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p>	<p>Repair of animal shed</p> <p>Bring back the animals to the shed</p> <p>Cleaning and disinfection of the shed</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Encouraging farmers to cultivate short-term fodder crops like sunhemp.</p> <p>Deworming with broad spectrum dewormers</p> <p>Proper disposal of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Drying the harvested crop material and proper storage for use as fodder.</p> <p>Keep close surveillance on disease outbreak.</p>

	<p>diseases of the area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Identify the Clinical staff and trained paravets and indent for their services as per schedules</p> <p>Identify the volunteers who can serve in need of emergency</p> <p>Arrangement for transportation of animals from low lying area to safer places and also for rescue animal health workers to get involve in rescue operations</p>	<p>Emergency outlet establishment for required medicines or feed in each village</p> <p>Spraying of fly repellants in animal sheds</p>	
Cyclone	<p>Harvest all the possible wetted grain (paddy/wheat/Sorghum/Bajra./maize/horsegram/groundnut/ soya etc) and use as animal feed.</p> <p>Stock of anti-diarrheal drugs and electrolytes should be made available for emergency transport</p> <p>Don't allow the animals for grazing in case of early forewarning (EFW) of cyclone</p> <p>Incase of EFW of severe cyclone, shift the animals to safer places.</p>	<p>Treatment of the sick, injured and affected animals through arrangement of mobile emergency veterinary hospitals / rescue animal health workers.</p> <p>Diarrhea out break may happen. Health camps should be organized</p> <p>In severe cases un-tether or let loose the animals</p> <p>Arrange transportation of highly productive animals to safer place</p> <p>Spraying of fly repellants in animal sheds</p>	<p>Repair of animal shed</p> <p>Deworm the animals through mass camps</p> <p>Vaccinate against possible disease out breaks like HS, BQ, FMD and PPR</p> <p>Proper dispose of the dead animals / carcasses by burning / deep burying (4-8 feet) with lime powder (1kg for small ruminants and 5kg for large ruminants) in pit</p> <p>Bleach / chlorinate (0.1%) drinking water or water resources</p> <p>Collect drowned crop material, dry it and store for future use</p> <p>Sowing of short duration fodder crops in unsown and water logged areas when crops are damaged and no chance to replant</p> <p>Application of urea (20-25kg/ha) in the inundated areas and CPR's to enhance the bio</p>

			mass production.
Heat wave and cold wave			
Heat wave	<ul style="list-style-type: none"> i) Plantation around the shed ii) H₂O sprinklers / foggers in the shed iii) Application of white reflector paint on the roof iv) Thatched sheds should be provided as a shelter to animal to minimize heat stress 	<p>Allow the animals early in the morning or late in the evening for grazing during heat waves</p> <p>Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves</p> <p>Put on the foggers / sprinklers /fans during heat waves in case of high yielders (Jersey/HF crosses)</p> <p>In severe cases, vitamin 'C' and electrolytes should be added in H₂O during heat waves.</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Cold wave	Covering all the wire meshed walls / open area with gunny bags/ polyethylene sheets (with a mechanism for lifting during the day time and putting down during night time)	<p>Allow for grazing between 10AM to 3PM during cold waves</p> <p>Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves</p> <p>Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation</p>	<p>Feed the animals as per routine schedule</p> <p>Allow the animals for grazing (normal timings)</p>
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	During the event	After the event	
Drought				
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	Supplementation only for productive birds with house hold grain Supplementation of shell grit (calcium) for laying birds Culling of weak birds	Supplementation to all survived birds	
Drinking water		Use water sanitizers or offer cool hygienic drinking water		
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit	
Floods				
Shortage of feed ingredients	In case of early forewarning of floods, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc,	Use stored feed as supplement Don't allow for scavenging Culling of weak birds	Routine practices are followed Deworming and vaccination against RD	

Drinking water		Use water sanitizers or offer cool hygienic drinking water		
Health and disease management	In case of EFW, add antibiotic powder (Terramycin/Ampicilline/ Ampiclox etc., 10g in one litre) in drinking water to prevent any disease outbreak	Prevent water logging surrounding the sheds through proper drainage facility Assure supply of electricity by generator or solar energy or biogas Sprinkle lime powder to prevent ammonia accumulation due to dampness	Sanitation of poultry house Treatment of affected birds Disposal of dead birds by burning / burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed Vaccination against RD	
Cyclone				
Shortage of feed ingredients	In case of EFW, shift the birds to safer place Storing of house hold grain like maize, broken rice, bajra etc, Culling of weak birds	Use stored feed as supplement Don't allow for scavenging Protect from thunder storms	Routine practices are followed	
Drinking water		Use water sanitizers or offer cool drinking water		
Health and disease management	In case of EFW, add antibiotic powder in drinking water to prevent any disease outbreak	Sanitation of poultry house Treatment of affected birds Prevent water logging surrounding the sheds Assure supply of electricity Sprinkle lime powder (5-10g per square feet) to prevent	Disposal of dead birds by burning / deep burying with lime powder in pit Disposal of poultry manure to prevent protozoal problem Supplementation of coccidiostats in feed	

		ammonia accumulation due to dampness	Vaccination against Ranikhet Disease (0.5ml S/c)	
Heat wave and cold wave				
Shelter/environment management	<i>Heat wave:</i> Provision of proper shelter with good ventilation	In severe cases, foggers/water sprinklers/wetting of hanged gunny bags should be arranged Don't allow for scavenging during mid day	Routine practices are followed	
	<i>Cold wave:</i> Provision of proper shelter Arrangement for brooding Assure supply of continuous electricity	Close all openings with polythene sheets In severe cases, arrange heaters Don't allow for scavenging during early morning and late evening	Routine practices are followed	
Health and disease management	Deworming and vaccination against RD and fowl pox	Supplementation of house hold grain Provide cool and clean drinking water with electrolytes and vit. C In hot summer, add anti-stress probiotics in drinking water or feed	Routine practices are followed	

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine	-	-	-
Inland			
(i) Shallow water depth due to insufficient rains/ inflow	<ol style="list-style-type: none"> 1. Restricted release of water from reservoir. 2. Supplementary water harvest structures like pond and tanks has to be developed. 3. Renovation and maintenance of existing water harvest structures. 	-	-
(ii) Changes in water quality	1. Prepare to release water into the habitat.	1. Mixing of water from the water harvest structure like ponds and tanks into the fish habitat.	1. Monitoring the water quality and health of aquatic organisms.
(iii) Any other	-	-	-
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/ inflow	1. Building deep ditches in culture ponds for shelter of the fish to overcome high temperature	<ol style="list-style-type: none"> 1. Recharge the ponds with bore well water or water from other sources. 2. Partial harvesting of the stock to reduce stocking density. 3. Artificial shelter by putting aquatic floating weeds in 1/3rd area. 	-
(ii) Impact of salt load build up in ponds/ change in water quality	1. Application of organic manure in culture system	1. Recharge the ponds with bore well water or water from other sources	1. Application of organic manure in culture system