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)							
		Kharif			*Rabi*				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand 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**

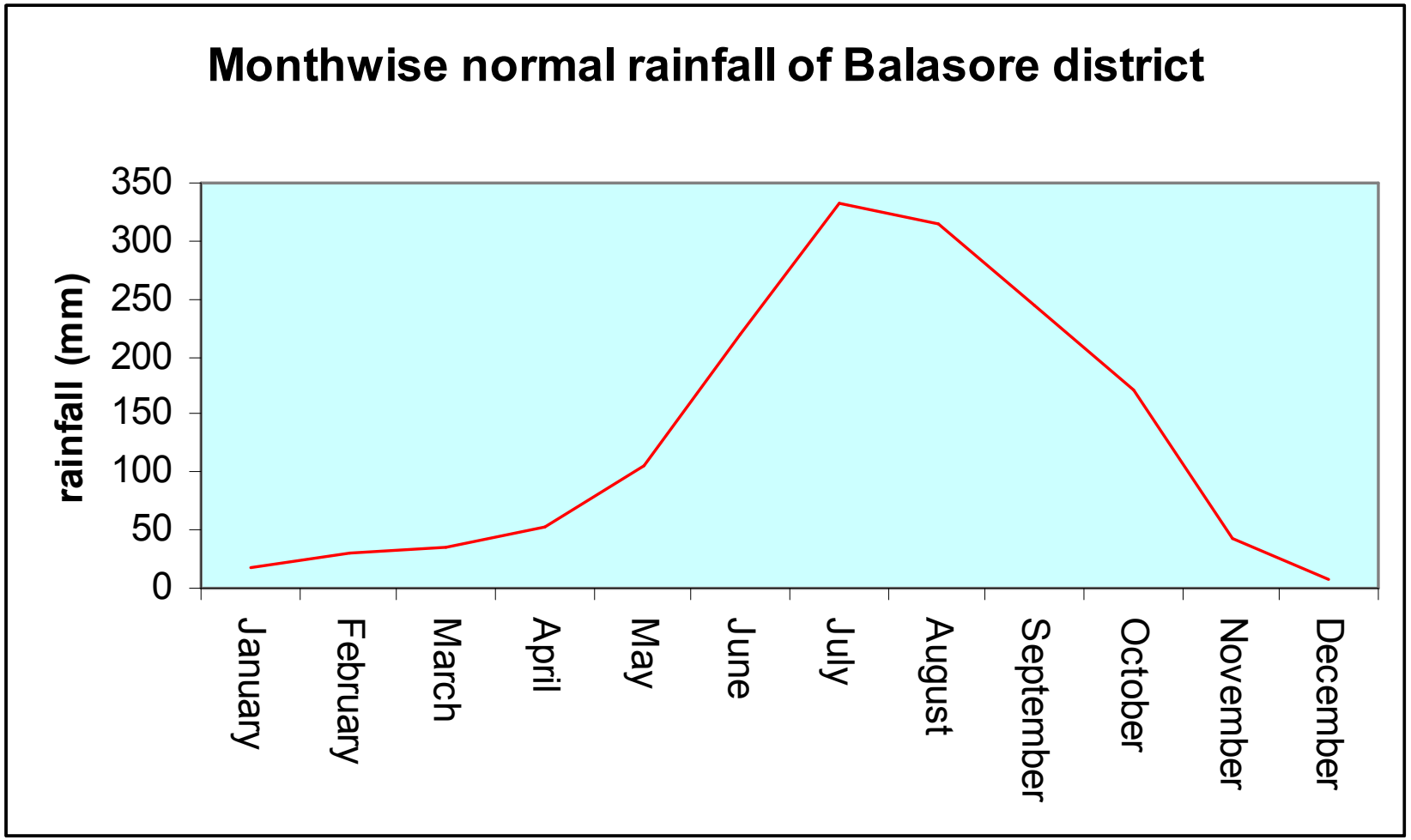
		Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	Production ('000 t)	Productivity (tonne/ha)	**as fodder** (‘000 tons)
	Brinjal	293.4	30.0	14.0	31.5	-	-	307.4	30.06	-
	Tomato	10.2	20.0	252.0	30.0	-	-	262.2	29.42	-
	Chilli (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	-

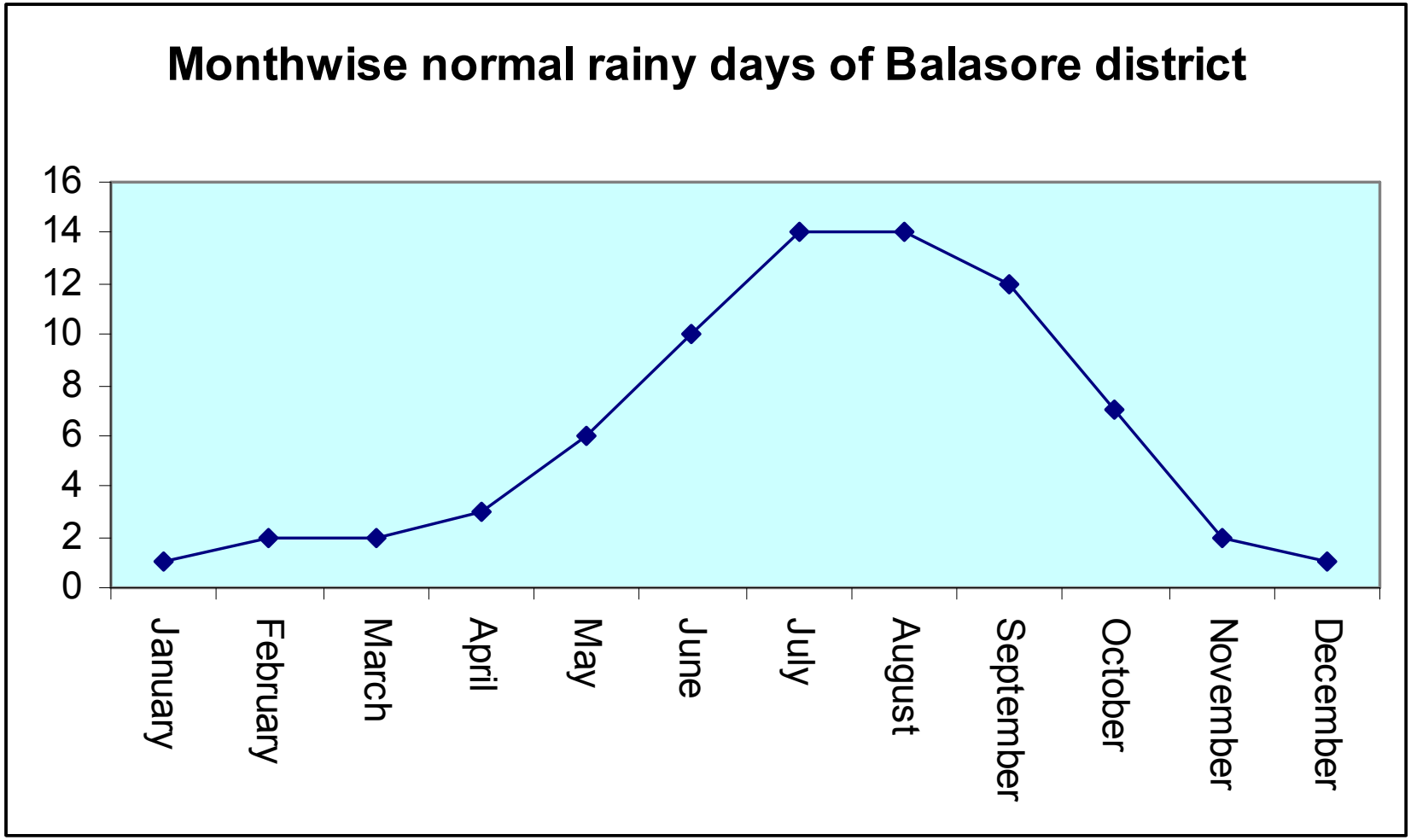
Source: Orissa Agric. Stat. 2008-09 and S.R.E.P., Balasore.

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

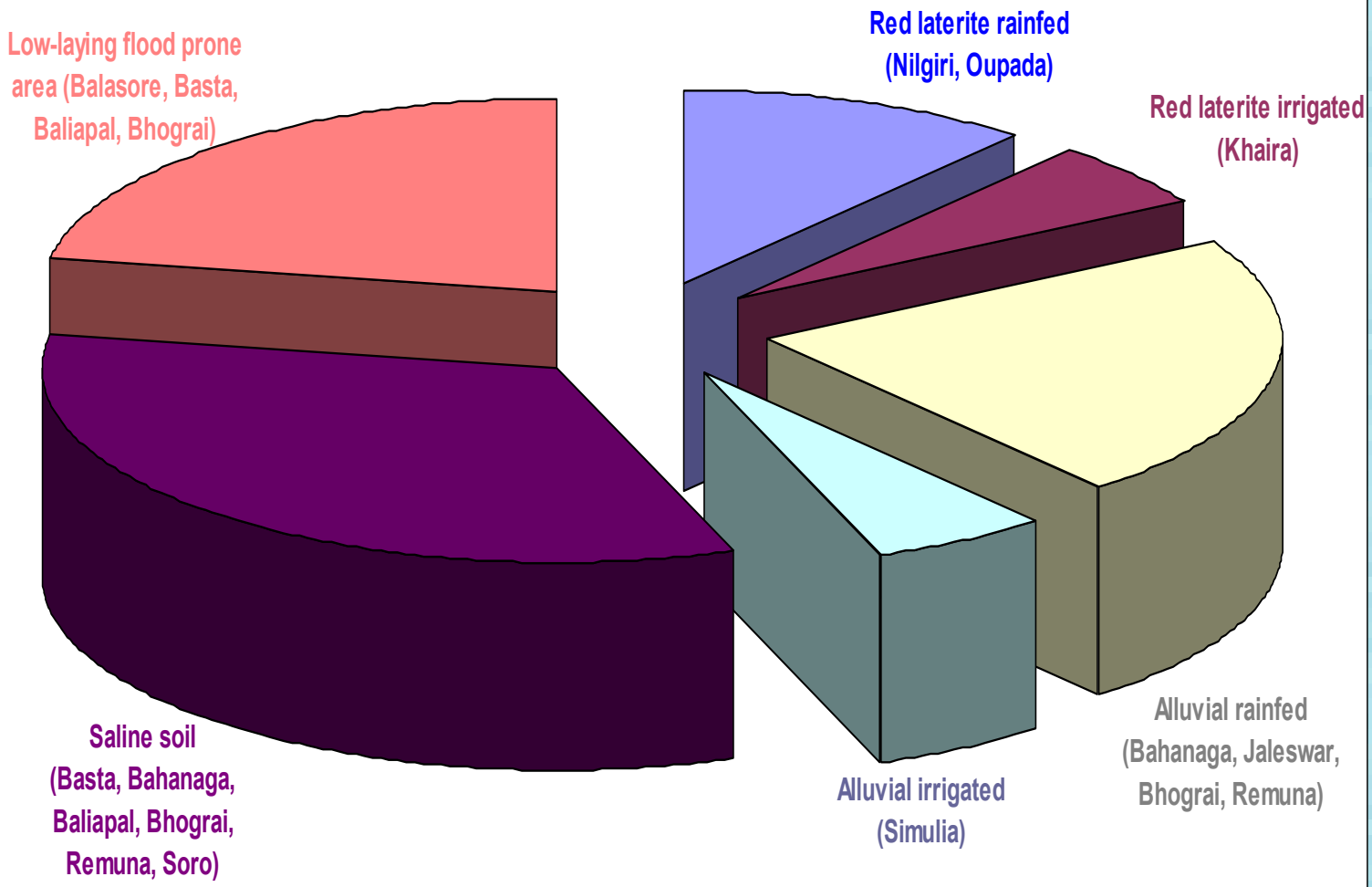
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure I	Enclosed: Yes
		Mean annual rainfall as Annexure 2	Enclosed: Yes
		Soil map as Annexure 3	Enclosed: Yes


Monthwise normal rainfall of Balasore district
rainfall (mm)
350
300
250
200
150
100
50
0
January
February
March
April
May
June
July
August
September
October
November
December


Monthwise normal rainy days of Balasore district
16
14
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December


District Map of Balasore, Orissa
N
W
E
S
West Bengal
Jaleswar
Mayurbhanj
Basta
Bhograi
Baliapal
Remuna
Balasore
Nilgiri
Oupada
Bahanaga
Bay of Bengal
Soro
Khaira
Simulia
KVK Balasore (Baliapal)
District Head Quarter
Bhadrak

Fig. 3 Agro-ecological Situations of Balasore Disrtict




SOIL FERTILITY MAP OF
BALASORE DIST.
WEST BENGAL
JALESWAR
BHOGRAI
MAYURBHANJ DIST
BAY OF BENGAL
KHAIRA
BHADRAK DIST
N
S
LEGENDS
SALINE
ALUVIAL & OTHERS
LATERITIC
14,729ha 5.5%
2,03,508 75.5%
51,393 19%

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**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
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. **Greengram:** PDM-11 & 54, Hum-1. **Blackgram:** T-9, WBU-108, Sarala, pant-U-19, 30, 35 **Sesamum** Kanak, Prachi, Kalika, Usha **Groundnut** Smruti, TG-3, Phule Pragati, ICGS-11, ICGS-44.	• 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	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Alluvial soils in medium lands	Rice-fallow	**Growing of Medium duration rice variety:** Lalat, Swarna, Mahsuri. (120-135 days) **Variety for growing of Lowland rice:** Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree.(140-145 days duration)	• Summer ploughing • Use of bulky organic manures • Ridges and furrow methods of sowing • Proper spacing • Transplanting rice • In-situ rain water conservation,	

			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	**Lowland rice:** Lunishree, Luna Sampad, Luna Suvarna, CSR-10, Sonamani, Tapaswani **Vegetables :** Sugarbeet, sweet potato	• Summer ploughing • Use of bulky organic manures • Ridges and furrow methods of sowing • Proper spacing • Transplanting rice In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge.	
	Flood prone area Lowland	Rice- Vegetable Fallow-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.	• 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.	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM

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

				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 : S**ugarbeet, Sweet potato	-Do-	
	Flood prone area Lowland	Rice- Vegetable Fallow-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-	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 3rd 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

				The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be placed as basal. The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing. Use of bulky organic manures is recommended.	
	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.	In-situ rain water conservation, harvesting of excess runoff for recycling and ground water recharge. Seed treatment and proper plant	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM

		Vegetable-fallow	Growing short duration vegetable like cucumber, okra, Cowpea	protection measures should be taken to avoid any germination failure because sowing has already got delayed because of late onset of monsoon. The recommended dose of nitrogen application should be reduced by 40 % in rainfed situation and should be applied, as basal and full-recommended dose of P and K should be placed as basal. The field should be free of weeds for utilization of water and nutrients by the late sown crops. Furrow sowing of kharif crops at closure plant-to-plant distance with wider inter-row spacing. Use of bulky organic manures is recommended.	
	Coastal alluvial saline soils Lowland	Rice-fallow	**Lowland rice:** Lunisee, Savitri, Gayatri, Padmini, Moti, Mahalaxmi, Rajashree (140-145 days duration) , **Vegetables :** Sugarbeet, Sweet potato	-Do-	
	Flood prone area Lowland	Rice- Vegetable Fallow-vegetable	**Lowland rice:** Swarna Sub-1, Barsha, Kanchan, Ramachandi, Durga,Uphar, Sarala, arshadhan for semi-deep low lands are suggested for flash flood situations. **Vegetable:** Cucurbits, cole crops, solanaceous, greens, root crops.	-Do-	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 Weeks 1st 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 *rabi* 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 : S**ugarbeet, Sweet potato	-Do-	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Flood prone area Lowland	Rice- vegetable Fallow-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-	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measues**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	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

			sowing of direct seeded rice should be avoided till sufficient rains have been received. Raising community nurseries of rice is recommended for transplanted rice. If sufficient good quality seed is not available, locally available seeds from adjoining areas should be used after proper germination check. Seeds treatment with Thiram or Captan @ 2-2.5 g/kg seed and other recommended plant protection measures.	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.	through ATMA, OSSC and NFSM
	Coastal alluvial saline soils	Low land rice-fallow	-Do-	Strengthen the field and contour bunds for in-situ moisture conservation. Utilise already harvested rainwater as life saving or protective irrigation.	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Flood prone area	Low land rice-vegetable Fallow-vegetables	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.	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. 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 *rabi* crops to ensure proper germination.	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Lateritic soils Upland	Rice-fallow	Thinning	• 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	• Seed drill under RKVY. Supply of seeds through ATMA, OSSC and NFSM
	Alluvial soils Medium land	Rice-fallow		• 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		Suggested Contingency measures			
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Lateritic soils Upland	Rice-fallow	• Thinning • Providing life saving irrigation • Irrigate every alternate furrow on rotation.	• Foliar application of fertilizers • Mulching should be practiced in between crop rows using locally available mulch material	
	Alluvial soils Medium land	Rice-fallow	• 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.	• 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-	• 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	• Irrigate every alternate furrow on rotation. • Life saving irrigation from harvested rainwater • Adoption of micro-irrigation to save water.	• Mulching in between crop rows	

Condition			**Suggested Contingency measures**		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Lateritic soils Upland	Rice-fallow	• Life saving irrigation from harvested rainwater • Adoption of micro-irrigation to save water.	• 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	• 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	• 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.	• 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	• 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	• 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	• 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	• 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	• Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons.	• Same as above for kharif rice.	
	Flood prone area	Lowland rice-vegetables Fallow - vegetables	• Growing of short duration legumes like cowpea, bean or root vegetables like radish during rabi seasons.	• 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	• Rice area during rabi should be reduced. • Growing low water requiring Oilseeds and Pulses like groundnut, green gram, black gram, sunflower and sesamum	• 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 or tanks. These will recharge ground water during normal or excessive	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				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 *rabi* 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**			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
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-

2.3 Floods

Condition	Suggested contingency measure			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
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 *rabi* 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, GAINT 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

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

	All the stock must be immunized for endemic diseases of the area Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures Procure and stock multivitamins & area specific mineral mixture	Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic Tick control measures be undertaken to prevent tick borne diseases in animals Rescue of sick and injured animals and their treatment Organize with community, daily lifting of dung from relief camps	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
Floods			
Feed and fodder availability	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) Protect the dried Dongri grass, sorghum stover etc., from inundation of flood water Keeping sufficient of dry fodder to transport to the flood affected villages Don't allow the animals for grazing if severe floods are forewarned Keep stock of bleaching powder and lime Carry out Butax spray for control of external parasites Procure and stock emergency medicines and vaccines for important endemic diseases of the area All the stock must be immunized for endemic	Transportation of animals to elevated areas Proper hygiene and sanitation of the animal shed In severe storms, un-tether or let loose the animals Use of unconventional and locally available cheap feed ingredients for feeding of livestock. Avoid soaked and mould infected feeds / fodders to livestock Carryout deworming to all animals entering into relief camps Identification and quarantine of sick animals Constitution of Rapid Action Veterinary Force Performing ring vaccination (8 km radius) in case of any outbreak Restricting movement of livestock in case of any epidemic	Repair of animal shed Bring back the animals to the shed Cleaning and disinfection of the shed Bleach (0.1%) drinking water / water sources Encouraging farmers to cultivate short-term fodder crops like sunhemp. Deworming with broad spectrum dewormers Proper disposable 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 Drying the harvested crop material and proper storage for use as fodder. Keep close surveillance on disease outbreak.

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

			mass production.
Heat wave and cold wave			
Heat wave	i) Plantation around the shed ii) H_2O 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	Allow the animals early in the morning or late in the evening for grazing during heat waves Feed green fodder/silage / concentrates during day time and roughages / hay during night time in case of heat waves Put on the foggers / sprinklers /fans during heat weaves in case of high yielders (Jersey/HF crosses) In severe cases, vitamin 'C' and electrolytes should be added in H_2O during heat waves.	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
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)	Allow for grazing between 10AM to 3PM during cold waves Add 25-50 ml of edible oil in concentrates and fed to the animal during cold waves Apply / sprinkle lime powder in the animal shed during cold waves to neutralize ammonia accumulation	Feed the animals as per routine schedule Allow the animals for grazing (normal timings)
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	Submission for insurance claim and availing insurance benefit Purchase of new productive animals

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 line 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	***Heat wave:*** 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	
	Cold wave: 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	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	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