STATE: ODISHA

AGRICULTURE CONTINGENCY PLAN FOR DISTRICT: KEONJHAR

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern plateau (chhotanagpur) And Eastern Ghats, Hot Subhumid Eco-Region (12.3)		
	Agro-Climatic Zone (Planning Commission)	Eastern Plateau & Hills Region-VII		
	Agro Climatic Zone (NARP)	North Central Plateau Zone (OR-2)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Mayurbhanj, Major parts of Keonjhar (Except Anadpur & Ghasipura block)		
	Geographic coordinates of district headquarters	**Latitude**	**Longitude**	**Altitude**
		21º37'48.00" N	85º34'48.00" E	533 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	RRTTS, Keonjhar, Orissa - 758 002		
	Mention the KVK located in the district with address	Krishi Vigyan Kendra, Judia Farm, P.O. Keonjhar, Orissa, Pin-758 002		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	RRTTS Campus, Judia Farm, Keonjhar, 758002		

1.2	Rainfall	Normal RF(mm)	Normal Rainy days (number)	Normal Onset (specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-September)	1144.1	54.6	June 2nd week	September 4th week
	NE Monsoon(October-December)	126.2	6.5	October 1st week	December 1st week
	Winter (January - February)	81.5	3.0		
	Summer (March - May)	136.9	10.9		
	Annual	1488.7	75.0		

1.3	**Land use pattern of the district** (latest statistics)	Geographical area	Cultivated 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)	830	298	310	77	20	26	06	93	08	0

Source: Orissa Agricultural Stastics, 2008-09

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area ('000 ha)	Percent (%) of total
	Red soils	342.0	41.2
	Lateritic soils	241.0	29
	Alluvial soils	91.4	11
	Mixed red & yellow soils	83.0	10
	Mixed red & black soils	73.0	8.8
	Others (specify):	-	-

1.5	**Agricultural land use**	Area (‘000 ha)	Cropping intensity %
	Net sown area	290	152
	Area sown more than once	150	
	Gross cropped area	440	

1.6	**Irrigation**	Area (‘000 ha)		
	Net irrigated area	63		
	Gross irrigated area	106.8		
	Rainfed area	227		
	Sources of Irrigation	Number	Area (‘000 ha)	Percentage of total irrigated area
	Canals		-	-
	Tanks (Reservoir)	3	27.2	
	Open wells	2792	4.4	
	Bore wells	20205	8.1	
	Lift irrigation schemes	235	3.3	
	Micro-irrigation			
	Other sources (please specify)	-	7.5	
	Total Irrigated Area		-	
	Pump sets	NA	NA	
	No. of Tractors			
	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	-	-	
	Critical	-	-	
	Semi- critical	-	-	
	Safe	-	-	
	Wastewater availability and use	-	-	
	Ground water quality	NA		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (as per latest figures).

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	Rice	52.8	152.3	205.2	2.0	-	2.0	-	207.2
	Maize	1.1	26.2	27.2	0.2	-	0.2	-	27.4
	Blackgram	-	18.3	18.3	0.2	6.4	6.7	-	25.0
	Horsegram	-	-	-	-	15.8	15.8	-	15.8
	Niger	-	14.2	14.2	-	1.5	1.5	-	15.6
	Greengram	-	7.5	7.5	0.1	6.7	6.8	-	14.3

Source: Orissa Agricultural Statistics, 2008-09

	Horticulture crops - Fruits	**Area ('000 ha)**
		Total
	Mango	7.7
	Cashew	3.8
	Horticulture crops - Vegetables	Total
	Brinjal	11.7
	Tomato	15.0

	Radish	0.6
	Chilli	4.7
	Medicinal and Aromatic crops	**-**
		-
	Plantation crops	**Total**
	Cashew nut	3.8
	Coconut	1.2
	Eucalyptus	3.8
	A. auriculiformis	1.2
	Fodder crops	**Total**
	Total fodder crop area	**-**
	Grazing land	**-**
	Sericulture etc	680 ha (Production 3.52 lakh cocon)
	Others (specify)	-

1.8	**Livestock**	**Male (‘000)**	**Female (‘000)**	**Total (‘000)**
	Non descriptive Cattle (local low yielding)	-	-	144.8
	Improved cattle	-	-	-
	Crossbred cattle	-	-	122.7
	Non descriptive Buffaloes (local low yielding)	-	-	-
	Descript Buffaloes	-	-	613.5
	Goat	-	-	519.0
	Sheep	-	-	104.5
	Others (Pig, etc.)	-	-	699.8
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds (‘000)**	
	Commercial	NA	1026.1	
	Backyard	NA	210.0	

1.10	**Fisheries** (Data source: Chief Planning Officer)						
	A. Capture						
	i) 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)	
		-	-	-	-	-	-
	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		6560		2		3447	

	B. Culture			
		Water Spread Area (ha)	**Yield (t/ha)**	**Production (‘000 tons)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)			
	ii) **Fresh water** (Data Source: Fisheries Department)	3255.90	2.7	8725.8
	Others			

Dept of Fisheries Annual Report 2009-10
Dept of Animal Husbandry, Annual Report 2008-09

1.11 Production and Productivity of major crops (Average of last 5 years: 2005-06 to 2009-10, Source DDA, Keonjhar)

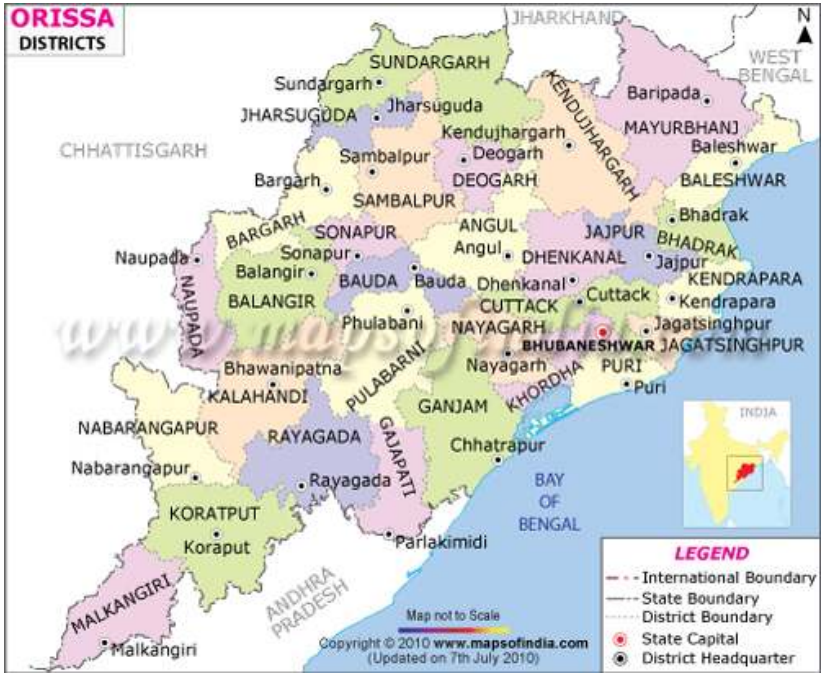
1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder (‘000 tons)
		Production ('000 Mt)	Productivity (kg/ha)	Production ('000 Mt)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 Mt)	Productivity (kg/ha)	
Major Field crops (Crops to be identified based on total acreage)										
	Paddy	415.76	1996			5.45	2696	421.21	2003	-
	Maize	28.19	1035	0.22	1169			28.41	1036	-
	Blackgram	6.41	350	2.96	445			9.37	375	-
	Horse gram	-	-	7.04	445			7.40	445	-
	Niger	3.57	252	0.41	285			3.98	255	-
	Greengram	3.44	460	3.12	458			6.56	459	-
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango					10.83	141	10.83	141	-
	Guava	9.537	646					9.537	646	-
	Citrus	11.365	773					11.365	773	-
	Tomato			201.763	1339			201.763	1339	-
	Brinjal	190.481	1630					190.481	1630	-
	Sweet potato	24.354	900					24.354	900	-

Source: Orissa Agricultural Stastics, 2008-09

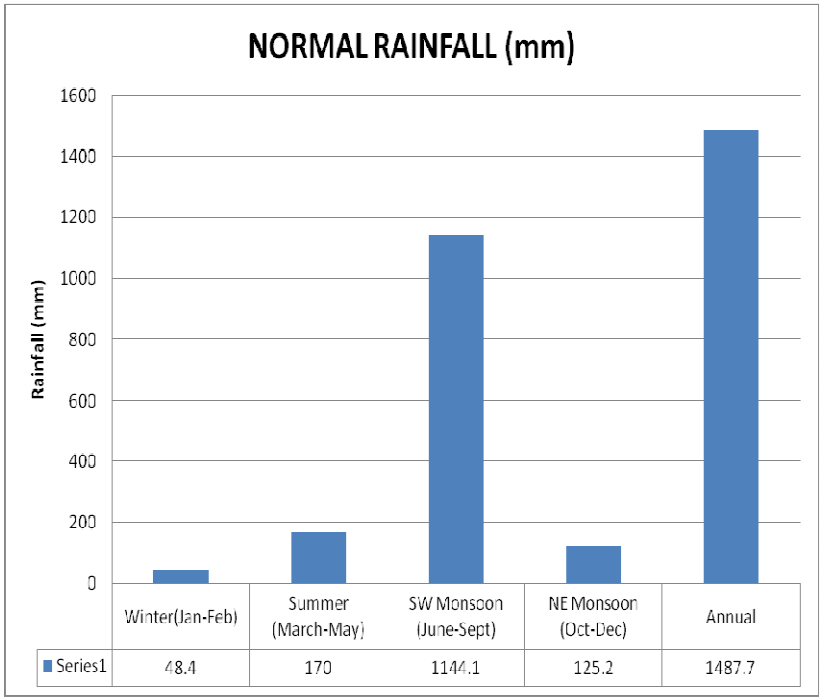
1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Maize**	**Pulses (Blackgram)**	**Niger**	**Vegetables**
	Kharif- Rainfed	2nd week of June-1st week of July	1st week of June-1st week of July	2nd week of June-1st week of July	2nd week of August-1st week of September	2nd week of June-2nd week of july
	Kharif-Irrigated	2nd week of July-1st week of August	2nd week of June to 4th week of June	-	-	2nd week of June-2nd week of July
	Rabi- Rainfed	-	-	1st week of Oct-2nd week of Dec	1st week of Oct-2nd week of Oct.	-
	Rabi-Irrigated	-	3rd week of Dec-1st week of Jan	-	2nd week of Nov-1st week of Dec	1st week of Oct-3rd week of Nov
	Summer-Irrigated	2nd week of June-1st week of July	1st week of June-1st week of July	2nd week of June-1st week of July	2nd week of August-1st week of September	2nd week of June-2nd week of july

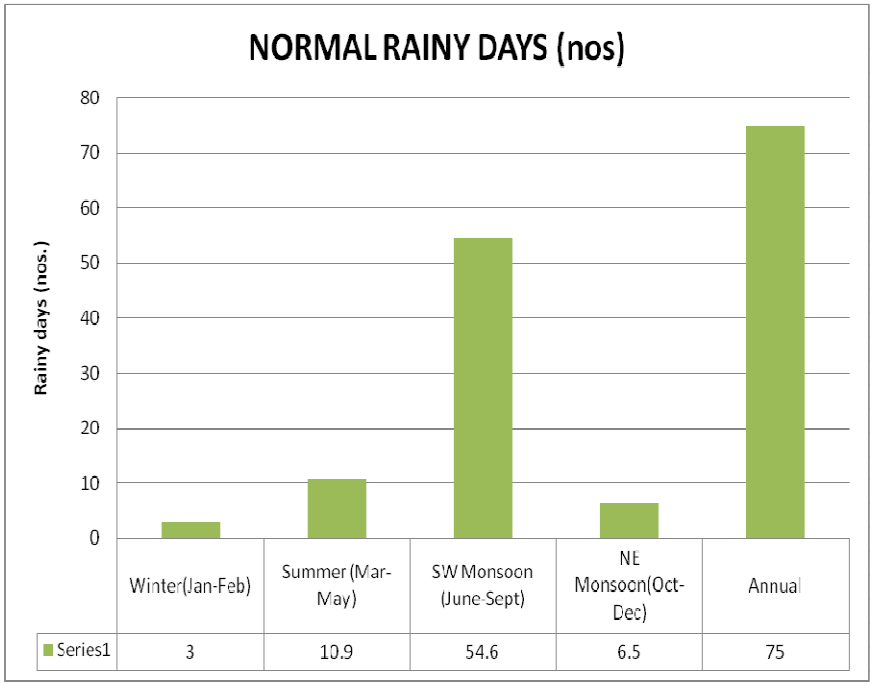
1.13	**What is the major contingency the district is prone to?** (Tick mark)		**Regular**	**Occasional**	**None**
	Drought			✓	
	Flood			✓	
	Cyclone				✓
	Hail storm				✓
	Heat wave			✓	
	Cold wave				✓
	Frost				✓
	Sea water intrusion				✓
	Pests and disease outbreak (Swarming caterpillar)			✓	
1.14	**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: No		

Annexure 1: Location Map of district map



Annexure 2: Mean Annual Rainfall





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 June 4th week	Medium elevation medium rainfall Lateritic soil Upland	Rice-fallow	• Growing short duration varieties like Sneha, Pathara, Jhu, Kalinga III • Intercropping like Rice +Arhar (5:2), Rice + Greengram/Blackgram (3:1), Rice + Radish (4:2) • Grow improved variety of intercrop • Arhar: UPAS-120, ICPL-87 • Blackgram: Pant U-19 &30,Ujala,Sarala, Prasad • Greengram: Sujata, Durga, PDM-11& 54 • Radish: Pusa Chetki, Delhi White	• Application of FYM/Organic manure at the time of final land preparation to increase the WHC of soil. • Application of lime @5 q/ha mixed with 5 ton FYM in furrows at the time of sowing in acid soil for better root development • Seed priming, bio-fertilizer inoculation • In-situ soil water conservation measures like ploughing and sowing across the slope, contour farming, strip cropping • Convert un-bunded uplands to bunded uplands • Adoption of tree based farming system with plantation of *Acacia mangium, Gmelina arborea, Leucaena leucocephla, L.diversifolia, Glarycidia sp, Anona squmosa* etc in the field bunds and alleys	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs MGNREGA
		Rice-	• Growing short duration varieties like JHU,	-do-	

		Blackgram/Horse gram	Kalinga III, • Intercropping like Rice+Greengram/Blackgram (3:1) • Grow improved variety of intercrop • Blackgram: Pant U-19 &30,Ujala,Sarala, Prasad • Greengram: Sujata, Durga, PDM-11& 54 • Followed by improved variety of Horse gram (Urmi), Blackgram (Pant U-19 &30,Ujala,Sarala, Prasad)		
		Maize-Toria	• Maize based intercropping like Maize +cowpea (2:2), Maize+ Runner bean (2:2), • Take early maturing varities like Navjot, Kiran , VL 16, DHM-109 • Cow pea: SEB-2, Utkal Manik • Runner bean: Suphala • Improved Toria variety like M-27	• Ploughing and sowing across the slope, • Application of FYM/Organic manure at the time of final land preparation to increase the WHC of soil. • Application of lime @5 q/ha mixed with FYM in furrows at the time of sowing in acid soil for better root development • Bio-fertilizer inoculation, • Seed treatment with CaCl2 solution 0.2% for 20 hours for improving drought resistance in plants • Ridge and furrow method of planting. • Application of FYM to increase the WHC of soil. At the time of final land preparation • Adoption of tree based farming system with plantation of *Acacia mangium, Gmelina arborea, Leucaena leucocephla,*	

				L.diversifolia, Glarycidia sp, Anona squamosa etc in the field bunds and alleys	
	Medium land/Low land	Rice-Chick pea/Field pea/Lentil	• Selection of short duration variety like Lalat, Manaswini, Naveen, , MTU 1010, Konark, and Surendra • Bund planting with Arhar, Cowpea, Greengram, Blackgram etc. • Growing Field pea (Rachana), Lentil and Chick pea (JG 11) after paddy as paira crop or relay crop. • Adopt agroforestry with bund plantation with *Gmelina arborea, Leucaena leucocephla, L.diversifolia, Glarycidia sp, Anona squmosa* etc • Grow grasses like *Stylosanthes,* Dinanath grass etc. in the field bunds for fodder purpose	• Raising community nursery in the vicinity of water sources like village tanks • Application of fertilizer and vermicompost/bio-fertilizer in the nursery for early seedling growth and sowing of pre-germinated seed. • Application of FYM to increase the WHC of soil. • Repair field bunds to protect seepage loss.	
		Rice-Toria/Linseed	• Selection of short duration variety like Lalat, Manaswini, Naveen, , MTU 1010, Konark, and Surendra • Bund planting with Arhar, Cowpea, Green garm, Blackgram etc. • Growing Linseed, Toria after paddy. • Linseed Variety: Kiran • Toria Variety: Anuradha, Parvati • Adopt agroforestry with bund plantation with, *Gmelina arborea, Leucaena leucocephla, L.diversifolia, Glarycidia sp, Anona squmosa* etc • Grow grasses like *Stylosanthes,* Dinanath grass etc. in the field bunds for fodder purpose	-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 4 weeks July 2nd week	Medium elevation medium rainfall Lateritic soil Upland	Rice-fallow	• Select extra early upland Rice variety like Heera • Crop diversification of non-Paddy crops like Pulses (Arhar, Greengram, Blackgram), Oil seeds (Niger, Groundnut), vegetables (Okra, Brinjal .Tomato Cow pea, Cucurbits), Tuber crops (Sweet potato, Yam) etc. • Short duration varities of Maize can be grown. • Arhar: UPAS-120, ICPL-87, TURN-2 • Greengram: Dhauli, Kamdev, Durga • Blackgram: Sarala, Prasad, Ujala • Niger: Utkal niger-1 • Groundnut: TMV-2, Devi, Smruti • Yam : (Orissa Elite, Pusa Hemlata) • Sweet potato: Gouri • Tomato :Utkal Kumari, Utkal Raja Blue star, Brinjal: Green star, Utkal Anushree, Utkal Tarini • Cow pea: Utkal Manika • Okra :Utkal Gourav	• Building soil organic matter by application of FYM • Insitu soil water conservation measure like summer ploughing, ploughing across the slope, contour farming, ridge and furrow method of planting, mulching, • Seed treatment of pulses with CaCl2 solution 0.2% for 20 hours for improving drought resistance in plants	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs
		Rice-Blackgram/Horse gram	• Select extra early upland Rice variety like Heera • Growing pulses like Blackgram, Greengram or vegetables like off-season Radish • Greengram: Dhauli, Kamdev, Durga • Blackgram: Sarala, Prasad, Ujala • Horsegram: Urmi • Radish: Pusa chetki, Delhi white	• Building soil organic matter by application of FYM • Insitu soil water conservation measure like summer ploughing, ploughing across the slope, contour farming, ridge and furrow method of planting, mulching, • Seed treatment with CaCl2 solution 0.2% for 20 hours for	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs

				improving drought resistance in plants in pulse crops	
		Maize-Toria	• Grow short duration Maize varieties like Navjot, Kiran , VL 16, DHM-109 • Adopt maize based intercropping system like Maize+ Cowpea (2:2) • Maize+ Runner bean (2:2) • Cow pea: SEB-2, Utkal Manik • Runner bean: Suphala • Improved Toria variety like M-27	• Summer ploughing across the slope, biofertilizer inoculation, • Building soil organic matter by application of FYM • Seed treatment with CaCl2 solution 0.2% for 20 hours for improving drought resistance in plants	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs
	Medium land/Low land	Rice-Chick pea/Field pea	• Go for transplanting of 95-100 days duration variety like Khandagiri, Parihata, Jogesh, Bandana • Growing Field pea (Rachana), Lentil and Chick pea (JG 11) after paddy as paira crop or relay crop. • Bund planting with Arhar, Cowpea, Green garm, Blackgram etc. • Adopt agroforestry with bund plantation with *Gmelina arborea, Leucaena leucocephla, L.diversifolia, Glarycidia sp, Anona squmosa* etc • Grow grasses like *Stylosanthes,* Dinanth grass etc. in the field bunds for fodder purpose.	• Raising community nursery in the vicinity of water sources like village tanks and delay transplanting • Sowing of paddy nursery at 15 days interval. More area may be put under nursery • Apply life saving irrigation to maintain nursery seedlings. • Application of vermicompost/bio-fertilizer in the nursery for early seedling growth and sowing of pre-germinated seed. • Go transplanted paddy and avoid beushaning Rice • Repair and strengthen field bunds. • Heightening of field bunds to conserve rain water	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs

		Rice-Toria/Lin seed	• Selection of short duration variety like Lalat, Manaswini, Naveen, , MTU 1010, Konark, and Surendra • Bund planting with Arhar, Cowpea, Green garm, Blackgram etc. • Growing Linseed, Toria after paddy. • Lin seed variety: Kiran • Toria variety: Anuradha, Parvati • Adopt agroforestry with bund plantation with *Gmelina arborea, Leucaena leucocephla, L.diversifolia, Glarycidia sp, Anona squmosa* etc • Grow grasses like *Stylosanthes,* Dinanath grass etc. in the field bunds for fodder purpose.	• Raising community nursery in the vicinity of water sources like village tanks • Sowing of paddy nursery at 15 days interval. More area may be put under nursery • Apply life saving irrigation to maintain nursery seedlings • Application of fertilizer and vermicompost/bio-fertilizer in the nursery for early seedling growth and sowing of pre-germinated seed. • Application of FYM to increase the WHC of soil. • Repair field bunds to protect seepage loss.	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs

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 **July 4th week**	Medium elevation medium rainfall Lateritic soil Upland	Rice-fallow	• Raising low water requiring non-paddy crops like Ragi (Divyasingh), Niger (Utkal Niger, Birsa Niger-1), Pulses (Greengram, Blackgram, • Cowpea (SEB II, Swarna), • Oil seed • Groundnut (Devi, Smruti, TMV-2 • Vegetables: • Offseson Radish (Pusa Chetki, Delhi white) • Kharif Tomato (Utkal Kumari), • Coriander (Karishma) • Brinjal (Green star)	• Timely interculture and weeding, balanced nutrition for healthy crop growth • Post emergence spray of Quizalofop 5%EC @ 0.05 kg ai / ha in 500lt of water to control weeds in Groundnut. • Spraying of 2% KCl + 0.1 ppm Boron to Blackgram to increase drought tolerance • Foliar application of 2% urea at pre-flowering and flowering stage of Greengram. • Spray 1% urea in vegetable	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs

				crops • Remove the pest and disease infected plants from the main field	
		Rice-Blackgram/Greengram/ Horsegram	Grow pulses like Blackgram, Greengram Greengram: Sujata, Durga, PDM-11& 54 Blackgram: Pant U-19 &30,Ujala,Sarala, Prasad	• Optimum plant population, seed inoculation bio-fertilizer, balanced fertilizer application, application of FYM to increase WHC. • Post emergence spray of Quizalofop 5%EC @ 0.05 kg ai / ha in 500lt of water to control weeds in Groundnut. • Spraying of 2% KCl + 0.1 ppm Boron to Blackgram to increase drought tolerance • Foliar application of 2% urea at pre-flowering and flowering stage of Greengram. • Spray 1% urea in vegetable crops • Remove the pest and disease infected plants from the main field	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs
		Maize-Toria	• Grow short duration pulses like Blackgram, Greengram • Greengram: Sujata, Durga, PDM-11& 54 • Blackgram: Pant U-19 &30,Ujala,Sarala, Prasad • Short duration off season vegetables like Radish (Pusa chetki, Delhi White), coriander (Karishma) • Followed by Toria , variety:M-27	Line sowing , application of FYM biofertilizer inoculation	
	Medium land / Low land	Rice-Pulse(Chick pea/Field Pea/Lentil)	• Go for transplanting of 95-100 days duration variety like Khandagiri, , Bandana • Bund planting with Arhar, , Cowpea, Green garm, Blackgram etc	• Raising community nursery in the vicinity of water sources like village tanks • Application of fertilizer and	

			• Followed by paira cropping with chick pea : JG-11, Annegiri-1 Field pea: Rachna, Lentil: B-77, Pua-8	vermicompost/bio-fertilizer in the nursery for early seedling growth and sowing of pre-germinated seed. • Go for transplanted paddy and avoid beushaning Rice • On the onset of monsoon adopt closer spacing in Rice and bunch planting	
		Rice-Oil seed (Linseed/Toria)	• Go for transplanting of 95-100 days duration variety like Khandagiri, Bandana • Bund planting with Arhar, Cowpea, Green garm, Blackgram etc • Followed by sowing of Toria (Anuradha,Parvati), lin seed (Kiran)	-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 August 2nd week	Medium elevation medium rainfal Lateritic Soil Upland	Rice-fallow	• Raising low water requiring non-paddy crops like ragi (Divyasingh), niger (Utkal Niger, Birsa Niger-1), • Pulses (Greengram, Blackgram, Cowpea (SEB II, Swarna), Oil seed - Groundnut (Devi, Smruti, TMV-2 Vegetables: Off season radish (Pusa Chetki, Delhi white)Kharif Tomato (Utkal Kumari), Coriander (Karishma) Brinjal (Green star)	• Timely intercultural operation and weeding, balanced nutrition for healthy crop growth • Bio-fertiliser inoculation • Application of FYM to increase WHC. • Spraying of 2% KCl + 0.1 ppm Boron to Blackgram. • Foliar application of 2% urea at pre-flowering and flowering stage of Greengram. • Spray 1% urea in vegetable crops • Remove the pest and disease	RKVY, NFSM and ATMA. For awareness generation, training and time supply of inputs

				infected plants from the main field	
		Rice-Pulses (Blackgram/Chick pea)	Grow pulses like Blackgram(Pant U-19 &30,Ujala,Sarala, Prasad), Greengram (Sujata, Durga, PDM-11& 54)	• Optimum plant population, bio-fertilizer inoculation, balanced fertilizer application. • Spraying of 2% KCl + 0.1 ppm Boron to Blackgram. • Foliar application of 2% urea at pre-flowering and flowering stage of Greengram. • Spray 1% urea in vegetable crops • Remove the pest and disease infected plants from the main field	
		Maize-Toria	• Grow short duration pulses like Blackgram(Pant U-19 &30,Ujala,Sarala, Prasad) Greengram(Sujata, Durga, PDM-11& 54) • Short duration off seson vegetables like Radish (Pusa chetki, Delhi White), Coriander (Karishma) • Followed by Toria , variety:M-27	• Line sowing , • Application of FYM • Biofertilizer inoculation	
	Medium land/Low land	Rice-Pulse	• Go for transplanting of 95-100 days duration variety like Khandagiri, , Bandana • Bund planting with Arhar, , Cowpea, Greengram, Blackgram etc • Followed by paira cropping with Chick pea : JG-11, Annegiri-1 Field pea: Rachna, Lentil: B-77, Pua-8	• Raising community nursery in the vicinity of water sources like village tanks • Application of fertilizer and vermicompost/bio-fertilizer in the nursery for early seedling growth and sowing of pre-germinated seed. • Prefer transplanted paddy and avoid beushaning rice • On the onset of monsoon adopt closer spacing in rice and bunch planting	
		Rice-Oilseed	1. Go for transplanting of 95-100 days	-do-	

		(Linseed/Toria**)**	duration variety like Khandagiri, , Bandana 2. Bund planting with Arhar, Cowpea, Greengram, Black gram etc 3. Followed by sowing of toria (Anuradha, Parvati), linseed (Kiran)		

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.	Medium elevation and Medium rainfall Lateritic soil Upland	Rice-fallow	• When there is more than 50% mortality, re-sowing of the crop with shorter duration varieties • If the mortality is less than 50% gap filling may be done • Resowing with Short duration varieties like Heera, Jhu, Sneha, Pathara • Application of herbicide to control the weed population • Manual weeding for moisture conservation	Organic mulching through organic residues Application of FYM to increase WHC	NFSM, RKVY
		Rice-Pulses (Blackgram/Horse gram)	-do-	-do-	
		Maize-Toria	• Sow some cowpea / Greengram / Blackgram in the row spaces after onset of rainfall • Take extra sowing in 10 % of land or in leaf pots. Gap filling with the plants of equal duration • Seed soaking with CaCl2 0.25 % solution for 20 hours before sowing for drought hardening	Weed control measure Organic mulching through organic residues	

			• Early variety like Nabjot		
	Medium land/ Low land	Rice-Pulse(Chick pea/Field pea/Lentil)	• If plant population is less than 50%, re-sowing of the crop with shorter duration variety like recommended like Lalat, Manaswini, Naveen, MTU 1010, Konark, Jogesh and Surendra • Sprouted seeds of shorter duration variety may be directly shown or raised for seedling. • If plant population is more than 50% carry out weeding and adjust the plant population by Khelua and clonal propagation (double transplanting) • Raising of community nursery in the vicinity of water source • Use higher seed rate	• Develop series of farm ponds for harvesting the rainwater • Strengthen the field bunds and plugging of drainage holes	. NFSM, RKVY, NREGA
	Medium land/Low land	Rice-Oil seed (Toria /Lin seed)	–do-	• Develop series of farm ponds for harvesting the rainwater • Strengthen the field bunds and plugging of drainage holes	. NFSM, RKVY, NREGA

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	Medium elevation medium rainfall	Rice-fallow	• Thinning of excess plants, weeding, mulching and maintain optimum	Life saving irrigation	NFSM, ATMA

	Lateritic Upland		plant population Lime and FYM application • Apply Monocortophus @ 2 ml/liter of water to control mealy bug and thrips • Water stress during August and September may lead to severe incidence of blast and brown spot. Application of tricyclazole @ 0.6 ml/liter of water or Kasuagamycin @ 2 ml/liter of water at 15 days interval will reduce the incidence of blast.		
		Rice-Pulses (Blackgram) Horsegram/	• Maintain optimum plant population ,Lime and FYM application • Apply Monocortophus @ 2 ml/liter of water to control mealy bug and thrips • Application of tricyclazole @ 0.6 ml/liter of water or casuagamycin @ 2 ml/liter of water at 15 days interval will reduce the incidence of blast.	Life saving irrigation Weeding, mulching	NFSM, ATMA
		Maize-Toria	• Complete hoeing and weeding to provide dust mulch • Lime and FYM application • Ridge and furrow method of	Life saving irrigation Compartmental bunding	NFSM, ATMA

			planting • Soil application of chloropyriphus @ 2 ml/liter of water to prevent termite attack • Foliar application of mancozeb @ 3 g/liter of water against Tersicum leaf blight		
		Medium land /Low land Rice-Pulse (Chickpea/Field Pea/Lentil)	• Avoid beushaning (blind cultivation) in Rice, if the crop is more than 45 days old. • Weed out the field without waiting for rainfall. • Go for gap filling using seedling of same age or clonal tillers to have a uniform distribution of plant. • Withhold N fertilizer application up to receipt of rainfall. • Foliar spray of 2% urea solution • Apply Monocortophus @ 2 ml/liter of water to control mealy bug and thrips • Application of tricyclazole @ 0.6 ml/liter of water or casuagamycin @ 2 ml/liter of water at 15 days interval will reduce the incidence of blast.	On-farm water harvesting structures &Life saving irrigation Strengthen the field bunds and close the holes to check seepage loss.	NFSM, ATMA
		Medium land/Low land	–do-	On-farm water harvesting structures &Life saving	NFSM, ATMA

		Rice-Oil seed (Toria/Linseed)		irrigation.	

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measure**	**Remarks on Implementation**
At flowering/ fruiting stage	Medium elevation medium rainfall Lateritic soil Upland	Rice-fallow	• Provide protective irrigation through recycling of harvested rain water. Provide irrigation at critical stages such as flowering, grain filling etc. • Incidence of Rice mealybug may occur. Apply methyl demeton @ 500ml/ha or Imidaclopid @100 ml/ha • Grass hopper incidence may also occur. Dusting of cloropyriphus @ 25kg/ha in the field bunds recommended. • Termite incidence may occur apply chlorpyriphos @ 1lit/ha • Application of tricyclazole @ 0.6 ml/liter of water or casuagamycin @ 2 ml/liter of water at 15 days interval will reduce the incidence of blast	• Judicious use of water from farm pond • Life saving irrigation • Strengthening of field bunds.	NFSM, ATMA
		Rice-pulse (Blackgram/Chick pea)	–do-	• Judicious use of water from farm pond • Life saving irrigation • Strengthening of field bunds.	NFSM, ATMA

		Maize Toria	• Termite incidence may occur apply chloropyriphus @ 2ml/liter of water • If drought occurs at early maturing stage, harvest the green cobs and sell in the market. • Foliar application of mancozeb @ 3 g/liter of water against Tersicum leaf blight	• Provide protective irrigation through recycling of harvested rain water. • Provide irrigation at critical stages such as flowering, grain filling etc. in alternate furrows in wide spaced crops. • Organic mulching Manual weeding or apply herbicide	NFSM,ATMA
	Medium land/Low land	Rice-Pulse(Chick pea/Field Pea/Lentil)	• Provide protective irrigation through recycling of harvested rain water. • Withhold N fertilizer application up to receipt of rainfall. • Apply Potassic fertilizers wherever soil moisture allows or wait up to receipt of rainfall. • Strengthen the field bunds and close the drainage holes to check seepage loss.	• Judicious use of water from farm pond • Life saving Irrigation • Irrigation at critical stages	NFSM
		Rice-oil seed (Toria / Linseed)	-do-	-do-	-do-

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**
	Medium elevation medium rainfall Lateritic soil Upland	Rice- fallow	• Provide protective irrigation through recycling of harvested rain water. Provide irrigation at critical stages such as flowering, grain filling etc. • Application of tricyclazole @ 0.6 ml/liter of water or casuagamycin @ 2 ml/liter of water at 10 days interval to prevent outbreak of foliar, node and neck blast • Harvesting at physiological maturity stage		NFSM, ATMA
		Rice-Pulse (Blackgram/Horse gram)	• Provide protective irrigation through recycling of harvested rain water. Provide irrigation at critical stages such as flowering, grain filling etc. • Application of tricyclazole @ 0.6 ml/liter of water or casuagamycin @ 2 ml/liter of water at 10 days interval to prevent outbreak of foliar, node and neck blast		
		Upland Maize-Toria	• Provide protective irrigation through recycling of harvested rain water. Provide irrigation at critical stages such as flowering, grain filling etc. • Harvest maize for green cob purpose		NFSM, ATMA
	Medium land/Low land	Rice-Pulse(Chick pea/Field pea/Lentil)	• Provide protective irrigation • Arrange of crop insurance in case of		

			crop failure • Strengthen the field bunds		
		Rice-Oilseed (Toria/Linseed)	• Provide protective irrigation • Arrange of crop insurance in case of crop failure • Strengthen the field bunds		

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	Medium elevation irrigated Lateritic soil Medium land/Low land	Rice-Pulse (Chickpea/field pea/Lentil)	• Prefer Varities like Khandagiri, Yogesh • Utilization of water from other sources like pond water, harvested rain water	• Raise community nursery of Rice for transplanting to save time. • Apply FYM to increase the WHC of soil. • Reduction of conveyance losses during irrigation • Weed management • Irrigation at critical growth stages	-
		Rice-Oil seed (Toria/Linseed)	• Prefer varities like Khandagiri, Yogesh • Utilisation of water from other sources like pond water, harvested rain water • Weed management	• Raise community nursery of rice for transplanting to save time. • Apply FYM to increase the WHC of soil.	RKVY,NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			• Irrigation at critical growth stages	• Reduction of conveyance losses during irrigation	

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	Medium elevation irrigated Lateritic soil/ Medium land/Low land	Rice-Pulse (Chickpea/field pea/Lentil)	• Varities like Khandagiri, Yogesh, • Utilization of water from other sources like pond water, harvested rain water • Motivate the tail end farmers to grow low duty crops like pulses, oilseeds	-do-	RKVY,NFSM
		Rice-Oil seed(Toria/Linseed	-do-	• Raising community nursery • Apply FYM to increase the WHC of soil. • Reduction of conveyance losses during irrigation	

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	Medium elevation irrigated Lateritic soil Medium land/Low land	Rice-Pulse(Chickpea/field pea/Lentil)	• Varities like Khandagiri, Yogesh, • Utilisation of water from other sources like pond water, harvested rain water • Motivate farmers to grow low duty crops like pulses and oil seeds.	-do-	RKVY,NFSM
		Rice-Oil seed (Toria/Linseed)	-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	Medium elevation irrigated Lateritic soil Medium land/Low land	Rice-Pulse(Chickpea/field pea/Lentil)	Go for short duration varieties like Khandagiri, Yogesh	Raising community nursery	RKVY,NFSM
		Medium land/Low land Rice-Oilseed (Toria/Linseed)	-do-	-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	Medium elevation irrigated Lateritic soil /Medium land/Low land	Rice-Pulse(Chickpea/field pea/Lentil)	• Sow drought tolerant non paddy crops like, Greengram, Blackgram, Cowpea in place of Rice • Harvesting at physiological maturity stage.	• Groundwater recharge through development of percolation tank and farm ponds. • Mulching to conserve soil	NREGA, ATMA,RKVY, NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
				moisture • Take soil conservation measures.	
		Rice-Oil seed (Toria/Linseed)	-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**
Paddy	• If damage is more that 50% re-transplant Rice crop of medium duration group. • In partially damaged fields, allow the Rice plants to stand upright. • Do not go for beushaning as it may further reduce the plant population. • Carry out Weeding in the Rice field, make gap filling and top dress N and K to boost the growth if situation permits.	• Arrange for drainage • Take care to prevent the spread of disease like Sheath blight and Sheath rot and insect like BPH and Cut worms	Harvest as soon as the water recedes	Protect the seeds from rain, go for sun drying for two to three days

Maize	• Provide drainage • Give earthing up and clean weeds	• Arrange for drainage • Care should be taken to check disease like maydis leaf blight, T.L.B	-do-	-do-
Arhar	Provide drainage through intermittent drainage line.	Arrange for drainage, plant protection measures from disease and pest	-do-	-do-
Blackgram	Give drainage though drainage line.	• Arrange for drainage • Plantation measures against Jassids and YMV	-do-	-do-
Greengram	-do-	-do-	-do-	-do-
Horticulture				
Brinjal	Drainage of excess water from the field soil drenching with Carbendazim + streptocycline	Apply PCPA/NAA to prevent flower drop Provide drainage, plant protection measures against wilting and fruit rot.	If Wilting occurs – Soil drenching with Carbendazim + Streptocyclene	Shifting the produce to safer place to maintain the quality and immediate disposal of produce.
Tomato	Drainage of excess water from the field soil drenching with Bavistin + streptocycline	-do-	-do-	-do-
Cauliflower	In case of Incidence of collar rot -Spraying of Metalaxyl + Mancozeb, drainage of excess water.	If curd rot – apply Metalaxyl + Mancozeb Drainage the excess water	Immediate harvest and disposal	-do-
Okra	Drainage of excess water, plant protection measures against YVMV	Provide drainage and plant protection measures against YVMV	-do-	-do-
Papaya	Drainage of excess water, Spray Metalaxyl + Mancozeb at the plant base. Plant protection measures against white fly vector	Drainage of excess water, Spray Metalaxyl + Mancozeb at the plant base. Plant protection measures against white fly vector	-do-	-do-

Heavy rainfall with high speed winds in a short span				
Paddy	• If damage is more that 50% re-transplant Rice crop of medium duration group. • In partially damaged fields, allow the Rice plants to stand upright. • Do not go for beushaning as it may further reduce the plant population. • Carry out weeding in the Rice field, make gap filling and top dress N and K to boost the growth if situation permits.	Arrange for drainage	Harvest as soon as the water recedes	Protect the seeds from rain, go for sun drying for two to three days
Maize	Provide drainage	Provide drainage	Provide drainage	-do-
Arhar	-do-	-do-	-do-	-do-
Blackgram	-do-	-do-	-do-	-do-
Greengram	-do-	-do-	-do-	-do-
Horticulture				
Brinjal	If the plants are very young there may be uprooting and cracking of main stem Immediate application of soil at the base to strengthening and gap filling	Apply PCPA/NAA to prevent flower drop	Immediate harvest and disposal	Shifting the produce to safer place to maintain the quality and immediate disposal of produce.
Tomato	-do-	-do-	-do-	-do-
Cauliflower		-do-	-do-	-do-
Okra	-do-	Strengthening the plants by application of soil at the base	-do-	-do-
Papaya	-do-	Strengthening the plants by application of soil at the base	-do-	-do-
Outbreak of pests and diseases due to unseasonal rains				

Rice	• Heavy rainfall and flash flood like situation increase the swarming caterpillar incidence. Apply Choloropyriphos/DDVP in the bunds during evening hour • To avoid Case worm and leaf folder incidence apply Carbosulfan • Water logging situation may lead to sheath rot and sheath blight incidence timely application of validamycin and hexaconazole at 15 days interval.	• Sudden heavy rain followed by dry spell may result in severe occurrence of bacterial leaf streak and bacterial blight in Rice. It is advised to spray the crop immediately after each rain storm with streptocycline (0.01%) or plantomycin (0.1%) with copper oxychloride. Apply additional dose of Potash. • High humidity and high temperature may lead to BPH infestation , apply thiomethoxan @ 150g/ha • Incidence of climbing cutworm may occur, apply DDVP or Chloropyriphos during evening hours	Prolonged dry-spell after normal rainfall will increase the incidence of Grain blast. Spray tricyclazole @ 3ml / 5liter of water	Store Rice after proper drying to minimize the incidence of stored grain pest
Maize	Drain the excess water	Wilting in the water logging areas- Drain the excess water	-	-
Arhar	Wilt and pod borer incidence, apply imidacloprid and endosulphan	Wilt and pod borer incidence, apply imidacloprid and endosulphan	-	In storage condition prevent the incidence of pulse beetle by mixing the seed with some vegetable oil
Blackgram	High humidity increases the leaf hopper and Black aphid incidence. Apply imidacloprid	High humidity increases the leaf hopper and Black aphid incidence. Apply imidacloprid	-	-do-
Greengram	-do-	-do-	-	-do-
Horticulture				
Brinjal	Bacterial wilt may appear. Spray Carbandezim with plantomycin.	Fruit rot may occur. Apply metalaxyl + mancozeb @ 2g/litre	-	
Tomato	-do-	-do-	-	
Cauliflower	Colar rot incidence may aggravate. Apply metalaxyl + mancozeb @ 2g/litre	Head rot and cord rot incidence along with bacterial blight may appear. Apply plantomycin	-	

		@1g/liter of water along with copper oxycholoride @3g/litere		
Okra	Apply acetamiprid @ 4g/10liter of water to prevent YVMV incidence	-	Apply neem based pesticide or Bt to minimize foot borer incidence.	
Papaya	Rotting at basal portion, provide drainage	-	Harvest the fruit	-

2.3 Floods

Condition	**Suggested contingency measures**			
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. Nursery treatment with granular pesticide to prevent pest damage. • Raising nursery under **DAPOG** method • Apply DDVP / Chloropyriphos in the field and field bunds during evening hours to protect the crop against swarming caterpillars	• If the damage is less than 50 % adoption of double transplanting or clonal method of propagation is advocated. Additional dose of fertiliser (N,P,K) is recommended • Avoid beushaning operation • If damage is more than 50 % re-transplanting of crops with medium duration group is advocated. • Take precautionary measures against leaf folder and case worm	• Removal of sand from the field in case of sand deposition and planning for alternate crops like sweet potato under zero tillage. • If flood comes during reproductive stage, there is chance to damage Rice, emphasis should be given on forthcoming rabi crops.	Spraying plant growth hormones that prevent premature germination of Rice seeds.
Blackgram/Greengram	Resow the crop if damage is more than 50%. Prefer short duration variety	Apply imidacloprid to avoid hopper burn and black aphid incidence. Provide drainage Apply chloropyriphos + cypermethrin to protect the crop from hairy caterpillars	Apply endosulphan to prevent pod borer incidence	Harvest quickly to avoid seed shattering

Horticulture				
Tomato	Resowing of crop, grow short duration variety, gap filling in the main field	Application of potash fertilizer @5kg/acre, apply carbendyzim along with plantomycin to reduce wilt incidence. Apply additional dose of fertilizer to induce the vegetative growth	Crop should be harvested before fruit ripening stage in order avoid fruit roting. Need based application of metalaxyl + mancozeb to reduce further fruit rotting.	Store in well ventilated elevated places
Okra	Resowing of crop, grow short duration variety, gap filling in the main field	Apply mancozeb to reduce the incidence of Cercospora leaf spot and blight. Provide drainage. Apply additional dose of fertilizer to induce the vegetative growth	-	Harvest the fruit in tender stage and market it immediately
Cucurbits	Resow the crop with seed treatment in case of crop failure	Apply additional dose of fertilizer for early vigour. Spray thiophenate methyl against downy mildew		
Continuous submergence for more than 2 days				
Rice:	Maintaining nursery of over aged Rice seedlings of 45 days to 60 days duration. Nursery treatment with granular pesticide to prevent pest damage. Raising nursery under **DAPOG** method	If the damage is less than 50 % adoption of double transplanting or clonal method of propagation is advocated. Additional dose of fertiliser (N,P,K) is recommended Avoid beushning operation If damage is more than 50 % re-transplanting of crops with medium duration group is advocated. Take precautionary measures against leaf folder and case worm	Removal of sand from the field in case of sand deposition and planning for alternate crops like sweet potato under zero tillage. If flood comes during reproductive stage, there is chance to damage Rice, emphasis should be given on forthcoming rabi crops.	Spraying plant growth hormones that prevent premature germination of Rice seeds.
Blackgram/greengram	Resow the crop if damage is more than 50%. Prefer short duration variety	Apply immidacloprid to avoid hopper burn and black aphid incidence. Provide drainage Apply chloropyriphus + cypermethrin to protect the crop from hairy caterpillars	Apply endosulphan to prevent pod borer incidence	Harvest quickly to avoid seed shattering

Horticulture				
Tomato	Resowing of crop, grow short duration variety, gap filling in the main field	Application of potash fertizer @5kg/acre, apply carbendazim along with plantomycin to reduce wilt incidence. Apply additional dose of fertilizer to induce the vegetative growth	Crop should be harvested before fruit ripening stage in order avoid fruit roting. Need based application of metalaxyl + mancozeb to reduce further fruit rotting.	Store in well ventilated elevated places
Okra	Resowing of crop, grow short duration variety, gap filling in the main field	Apply mancozeb to reduce the incidence of cercospora leaf spot and blight. Provide drainage. Apply additional dose of fertilizer to induce the vegetative growth	-	Harvest the fruit in tender stage and market it immediately
Cucurbits	Resow the crop with seed treatment in case of crop failure	Apply additional dose of fertilizer for early vigour. Spray thiophenate methyl against downy mildew		
Sea water intrusion	NA			

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				
Paddy	Provide irrigation through sprinkler	Provide irrigation through sprinkler	Provide irrigation through sprinkler	-
Maize	-do-	-do-	-do-	-
Arhar	-do-	-do-	-do-	-
Blackgram	-do-	-do-	-do-	-

Greengram	-do-	-do-	-do-	-
Horticulture				
Tomato	Wilting and mortality due to heat – immediate irrigation and covering the nursery bed with paddy straw / local leaves	Immediate irrigation followed by mulching	Drying of flower- spraying of PCOA, Immediate irrigation followed by mulching	Less production of lycopene and yellowing of fruits, sun scalding – Application of Irrigation and immediate harvest and shifting to safer place
Brinjal	-do-	-do-	-do-	Application of Irrigation and immediate harvest and shifting to safer place
Okra	-do-	-do-	-do-	Application of Irrigation and immediate harvest and shifting to safer place
Cucurbits	-do-	-do-	-do-	Application of Irrigation and immediate harvest and shifting to safer place
Cold wave	NA			
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	Arrangement of Rice bran & paddy straw in advance	Providing sufficient feed to save the live stocks	-
Drinking water	Construction of bore well, cement vat & other infrastructures to store water	Providing sufficient water to the live stocks	-
Health and disease management	Preventive measures against contagious diseases	To go for fluid therapy and other treatments	Post event Vaccination, providing antibiotics & other life saving drugs
Floods			
Feed and fodder availability	Storing enough feed and fodder	Supply of feed during flood	-
Drinking water	Provision for storing drinking water	Supply of drinking water	Disinfection of water and sourcees
Health and disease management	Procurement and storing of medicines, Pre flood vaccination and innoculation	Keep livestocks in the shelter, Health camp during flood	Health camp, Vaccination after flood, proper disposal of carcass
Cyclone	NA	NA	NA
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management	Creation of awareness to avoid heat stress	Keep animal inside shelter, providing, water in time, bathing	-
Health and disease management	To stock essential medicines and water	Treatments	Post event health camp

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 sufficient feed	Feed with supplementary feed		
Drinking water	Infrastructure development to store and supply	Supply sufficient drinking water	-	
Health and disease management	Preventive measures against contagious diseases	To go for fluid therapy and other treatments	Post event Vaccination, providing antibiotics & other life saving drugs	
Floods				
Shortage of feed ingredients	Storing enough feed	Supply of feed during flood	-	
Drinking water	Provision for storing drinking water	Supply of drinking water	Disinfection of water and sourcees	
Health and disease management	Procurement and storing of medicines, Pre flood vaccination and innoculation	Keep in the shelter, treatment	Health camp, Vaccination after flood, proper disposal of carcass	
Cyclone	NA	NA	NA	
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management	Creation of awareness to avoid heat stress	Keep animal inside shelter/ protected cover, providing cold water in time, Spraying water	-	

Health and disease management	To stock essential medicines, vaccines and water	Treatments	Post event health camp	

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine	NA	NA	NA
Inland			
(i) Shallow water depth due to insufficient rains/inflow	1. Restricted release of water from reservoir/MIPs 2. Supplementary water harvest structures like pond and tanks has to be developed. 3. Renovation and maintenance of existing water harvest structures Check the spillage, Conserve water	Restrict the flow of water	Repair of tank/ MIP
(ii) Changes in water quality	Pumping new water from external sources	Pumping water and mixing	Water treatment
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Early stocking and rearing to marketing size	Harvesting of fish, replenishment of water	Renovation pond and dykes
(ii) Impact of salt load build up in ponds / change in water quality	Water treatment and quality management	Addition of good quality water and pumping	Water treatment with lime & medicines

2) Floods			
A. Capture			
Marine	NA	NA	NA
Inland			
(i) No. of boats / nets/damaged	Keep away the nets, boats away from the river , nets		
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water	Increase bund height and provision of sluice gate	Out flow of excess water through sluice gate	Bundh and pond repair
(ii) Water contamination and changes in water quality	Prophylactic measures like application of lime and CIFAX	Out flow of super ... water	Application of lime, alum, dolomite in water
(iii) Health and diseases	Prophylactic measures like application of lime and CIFAX	Inlet should be guarded with wire mesh	Fish and water treatment with medicine, lime
(iv) Loss of stock and inputs (feed, chemicals etc)	-	-	-
(v) Infrastructure damage (pumps, aerators, huts etc)	-	-	-
3. Cyclone / Tsunami	NA	NA	NA
A. Capture			
Marine	-	-	-
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			

(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
4. Heat wave and cold wave			
A. Capture			
Marine	NA	NA	NA
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)	Maintain good water quality and depth	Renovation	Water treatment
(ii) Health and Disease management	Pre-application of lime and medicines	Water quality management	Treatment of pond water