State: CHHATTISGARH

Agriculture Contingency Plan for District: Bijapur

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Eastern (Chhotanagpur) Plateau & Eastern Ghats hot sub-humid eco-region (12.1)		
	Agro-Climatic Zone (Planning Commission)	Eastern plateau and hills region (VII)		
	Agro Climatic Zone (NARP)	Bastar Plateau Zone		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Bastar, Dantawada, Bijapur, Narayanpur		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		18.8	80.8	315
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Zonal Agricultural Research Station –Now- SG College of Agriculture & Research Station Jagdalpur(Bastar) Chhattisgarh		
	Mention the KVK located in the district with address	KVK Jagdalpur & Dantawada		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Zonal Agricultural Research Station –Now- SG College of Agriculture & Research Station Jagdalpur(Bastar) Chhattisgarh		

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-Sep):	1338.8	56	10-June	15-Sept
	NE Monsoon(Oct-Dec):	95.4	8	-	-
	Winter (Jan- March)	10.1	4	-	-
	Summer (Apr-May)	14.8	8	-	-
	Annual	1459.0	76	-	-

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)	656.248	40.722	495.643	24.790	8.298	-	-	-	8.512	11.263

Source: Agricultural Statistics 2009, Commissioner land records, Raipur, Govt. of Chhattisgarh

1. 4	Major Soils (common names like red sandy loam deep soils (etc.,)*	Area (‘000 ha)	Percent (%) of total
	Entisols	30.255	36.92
	Associated Vertic & Vertisols (Black soils)	14.750	18.00
	Entisols/ Inceptisols	13.435	16.39
	Mollisols (*Bharri*)	13.213	16.12
	Alfisols (Red soils)	10.299	12.57

	Total	81.952	100.00

Source: Directorate of Agriculture, Govt. of Chhhattisgarh

1.5 Agricultural land use	**Area ('000 ha)**	**Cropping intensity %**
Net sown area	67.020	100.6
Area sown more than once	0.437	
Gross cropped area	67.457	

Source: Agricultural Statistics, 2009, Commissioner land record, Raipur, Govt. of Chhattisgarh

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	3.577		
	Gross irrigated area	3.577		
	Rainfed area			
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	9	0.044	0.02
	Tanks	446	3.302	1.41
	Open wells	246		
	Bore wells	-		
	Lift irrigation schemes	-		
	Micro-irrigation	-		
	Other sources (please specify)	-		
	Total Irrigated Area	-		
	Pump sets	-	-	-
	No. of Tractors	303	-	-
	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	-		
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

Source: Agriculture Statistics 2009, Commissioner land record, Raipur, Govt. of Chhattisgarh

1.7 Area under major field crops & horticulture (as per latest figures) (2009-10)

1.7	Major field crops cultivated	Area ('000 ha)							
		Kharif			*Rabi*				
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	Paddy	-	-	52.948	-	-	0.00	-	52.95
	Sorghum	-	-	0.116	-	-	0.019	-	0.14
	Maize	-	-	2.409	-	-	0.608	-	3.02
	Kodo-Kutki	-	-	0.272	-	-	-	-	0.27
	Chickpea	-	-	-	-	-	0.026	-	0.03
	Pea	-	-	-	-	-	0.031	-	0.03
	Lentil	-	-	-	-	-	0.035	-	0.04
	Pigeonpea	-	-	0.257	-	-	-	-	0.26
	Blackgram	-	-	0.435	-	-	0.213	-	0.65
	Greengram	-	-	0.371	-	-	0.514	-	0.89
	Horsegram	-	-	0.381	-	-	0.105	-	0.49
	Soybean	-	-	0.000	-	-	-	-	0.00
	Sesamum	-	-	0.215	-	-	.048	-	0.26
	Niger	-	-	0.086	-	-	0.098	-	0.18
	Sunflower	-	-	0.000	-	-	0.003	-	0.00
	Groundnut	-	-	0.025	-	-	0.130	-	0.16
	Toria/ Mustard	-	-	-	-	-	0.155	-	0.16
	Linseed	-	-	-	-	-	0.017	-	0.02
	Safflower	-	-	-	-	-	0.00	-	0.00
	Sugarcane	-	-	-	-	-	0.008	-	0.01
	Vegetable	-	-	1.130	-	-	0.140	-	1.27

Source: Agriculture Statistics 2009, Commissioner land record, Raipur, Govt. of Chhattisgarh

	Horticulture crops - Fruits	**Area ('000ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	1.665	-	-
	Guava	0.178	-	-
	Cashew	0.023	-	-
	Citrus	0.093	-	-
	Custard Apple	0.127	-	-
	Others (specify)	3.159	-	-
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Brassica spp.	0.057	-	-
	Brinjal	0.100	-	-
	Tomato	0.106	-	-
	Okra	0.500	-	-
	Potato	0	-	-
	Others (specify)	0.405	-	-
	Medicinal and Aromatic crops	**Total**	**Irrigated**	**Rainfed**
	Lemon Grass	0.011	-	-
	Plantation crops	**Total**	**Irrigated**	**Rainfed**
	Cashew	0.023	-	-
	Coconut	0.010	-	-
	Fodder crops	**Total**	**Irrigated**	**Rainfed**
	Total fodder crop area			
	Grazing land			
	Sericulture etc			
	Others (specify)			

Source: Directorate of Horticulture, Govt. of Chhattisgarh

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	-	-	160.029
	Improved cattle	-	-	-
	Crossbred cattle	-	-	-

1.9	Non descriptive Buffaloes (local low yielding)	-	-	-
1.10	Descript Buffaloes	5.296	6.095	18.544
	Goat	-	-	72.953
	Sheep	-	-	0.281
	Others (Camel, Pig, Yak etc.)	-	-	23.402
	Commercial dairy farms (Number)	-	-	-
	Poultry	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	-	127.914	
	Backyard	-		

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**
	124	20	479

B. Culture

	Water Spread Area (ha)	**Yield (t/ha)**	**Production ('000 tons)**
i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)	Nil	Nil	Nil
ii) **Fresh water** (Data Source: Fisheries Department)	850.20	2.079	1.650
Others			

Source: Directorate of Fisheries, Govt. of Chhattisgarh
Directorate of Vetenairy services 2006-07, Govt. of Chhattisgarh

1.11 Production and Productivity of major crops (Average of last 5 years: 2005, 2006, 2007, 2008 & 2009)

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)										
	Rapeseed-mustard			1.6	427.0			1.6	427.0	
	Horse gram			0.7	228.0			0.7	228.0	
	Sesamum			0.5	389.0			0.5	389.0	
	Greengram			0.2	290.0			0.2	290.0	
	Blackgram			0.2	265.0			0.2	265.0	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Mango							1.51	6330.5	
	Banana							1.00	25100.0	
	Papaya							0.56	17598.4	
	Ber							0.59	18530.0	
	Jackfruit							0.49	16931.0	

Source: **Agriculture Statistics 2009, Commissioner land record, Raipur, Govt. of Chhattisgarh**

1.12	Sowing window for 5 major field crops (start and end of normal sowing period)	Paddy	Jowar	Maize	Kodo-Kutki	
	Kharif- Rainfed	3rd week of June to 4th week of July	3rd week of June to 4th week of June	3rd week of June to 4th week of June	3rd week of June to 4th week of June	
	Kharif-Irrigated	1st week of June to 4th week of	-	-	-	

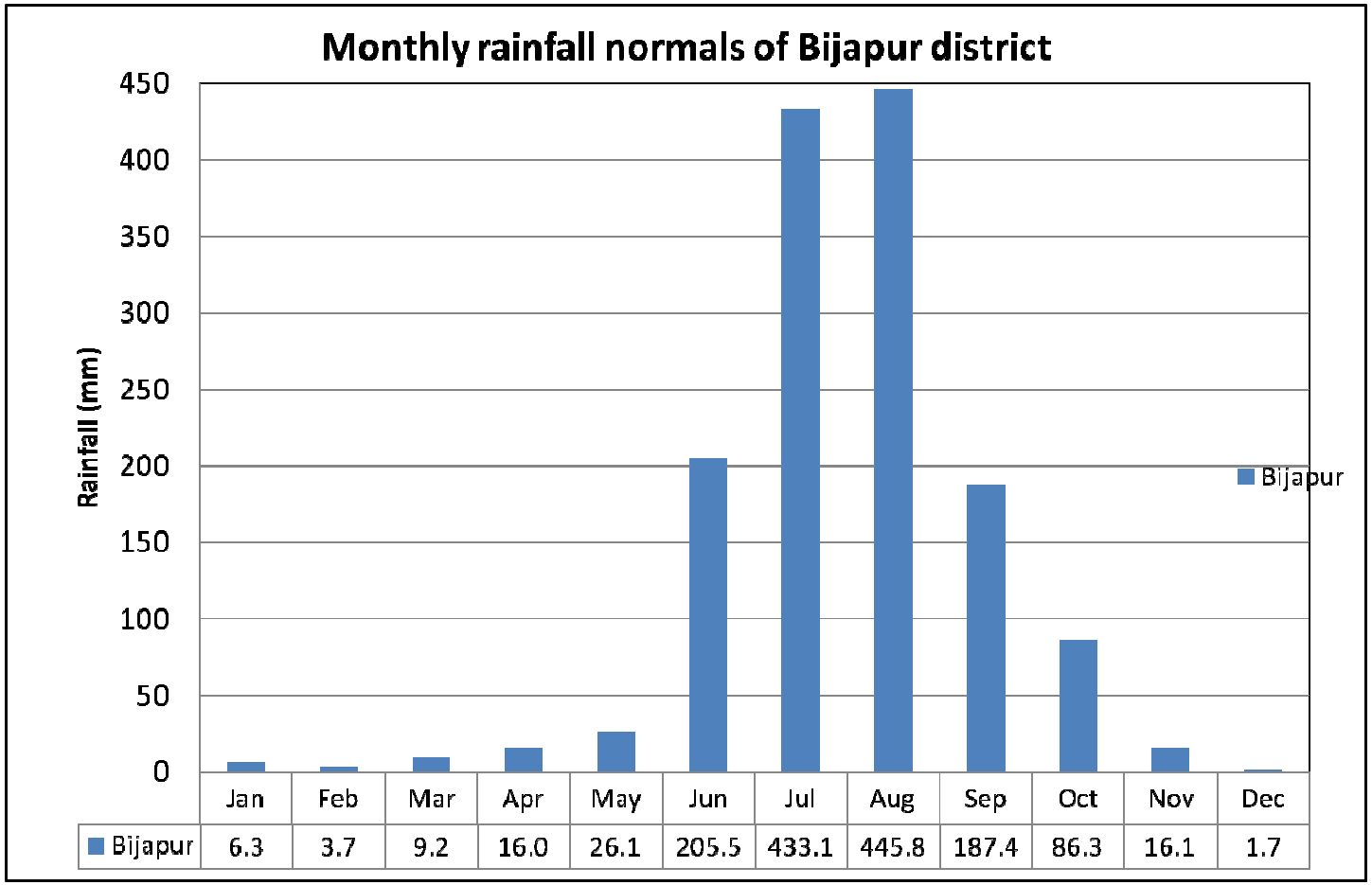
		July				
	Major Rabi crops	Rapeseed- Mustard	Horsegram	Sesamum	Greengram	Blackgram
	Rabi- Rainfed	-	1st week of September to 2nd week of September	-	3rd week of October to 4th week of October	3rd week of October to 4th week of October
	Rabi-Irrigated	2nd week of November to 3rd week of November	-	2nd week of November to 4th week of November	1st week of March to 3rd week of March	1st week of March to 3rd week of March

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: No

Annexure-1


Bijapur
To Solapur
13
To Solapur
MAHARASHTRA
Dhulakhed
Chadchan
Agarkhed
Zalki
Lachyan
Nibargi
Indi
Salotagi
Horti
Almel
Nimbal
Kannur
Atharga
Ramanalli Tank
Balaganur
Moratagi
Tamba
Kanamadi
Arkari
Sindgi
Tikota
Honnutagi
Halagali
Kannolli
Bijapur
GULBARGA
Kumatagi
Devar Hippargi
Honawad
Kondaguli
Bobleshwar
Mangoli
Ingaleshwar
Mulvad
Timbagi
Gundal
Mamdapur
Basavana Bagevadi
Huvin Hippargi
Telgi
Basavana
Talikota
Kolhar
Dhavalgi
Almatti
Chimmalgi
Nidgundi
Muddebihal
BAGALKOT
Nalatvad
To Kadlimatti
To Dharwar
13
Tangadgi
RAICHUR
N
District Boundary
River
National Highway
Major Road
Road
Railway Track
District Headquarter
Taluk Headquarter
Town
Tourist Place



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bijapur	6.3	3.7	9.2	16.0	26.1	205.5	433.1	445.8	187.4	86.3	16.1	1.7

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[a]**	**Normal Crop / Cropping system[b]**	**Change in crop / cropping system[c] including variety**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 2 weeks (Specify month)* 4th week of June	Slopy Upland (Marhan) Upland Bunded (Tikra)	Rice fallow – (Local variety , Broad casting)	Early duration varieties Aditya (90days), Vanprabha (90 days), Poornima (105 days), Danteshwari (105 days).	• Herbicide like Fenoxaprep P. Ethyl 9 EC @ 60 ml a.i./ ha. Chlorimura+Metsulfuran 20% @ 4 g ai/ ha. Almix @ 8g and whip super 250 ml dissolved in 10 l of water for 1 acre./Butachlor 1.5 kg ai/ha PE. Weeding by upland weeder. • 60:40:30 N:P:K full dose of P & K and ½ dose of N should be applied basal remaining N should be top dressed at tillering and PI stage.	• Percolation tank should be excavated on the upper corner for recharge/ life saving irrigation. • Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation
	Mid land (mal)	Rice fallow – (Local variety , Transplanting without planting geometry)	Poornima (105 days), Annada (105 days), Danteshwari (105days), Samleshwari (110days), MTU 1001 (120 days), MTU 1010 (110 days), Karma Mahsuri (125 days),	• Herbicide like Fenoxaprep P. Ethyl 9 EC @ 60 ml a.i. /ha.Chlorimura+Metsulfuran 20%@ 4 gms. ai/ ha. Almix @ 8g and whipsuper 250 ml dissolved in 10 l of water for	Percolation tank should be excavated on the upper corner for recharge/ life

			Madhuri (125 days)	1 acre/Butachlor 1.5 kg ai/ha PE. • 60:40:30 N:P:K full dose of P & K and ½ dose of N should be applied basal remaining N should be top dressed at tillering and PI stage.	saving irrigation. • Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation
	Lowland (Gabhar)	Rice	Bamleshwari (140 days) Swarna (145 days), Jaldoobi (140 days), Indira Sugandhit Dhan-1 (130 days), Pusa Basmati (130 days)	• Herbicide like Fenoxaprep P. Ethyl 9 EC @ 60 ml. AI/ ha. Chlorimura+Metsulfuran 20%@ 4 gms. ai/ ha. Almix @8gm and whipsuper 250 ml dissolved in 10 ltrs of water for 1 acre. /Butachlor 1.5 kg ai/ha PE. Weeding by lowland weeder. • 80:60:40 N: P: K full dose of P & K and ½ dose of N should be applied basal remaining N should be top dressed at tillering and PI stage.	• Farm pond for water storage/ irrigation. • Trenches should be dug out on the lower side of field for *in situ* moisture conservation

		Pigeonpea (Local)	Pigeon pea Improved variety like :Asha (180 – 200 days) C- 11 (180 – 200 days) Rajeev lochan (180- 190 days)	• 25:50:25 N:P:K kg/ha & 20 kg $ZnSO_4$ at sowing. • One hand weeding at 25-30 DAS • 2 intercultural operations at 20 & 40 DAS	• Ploughing by tractor drawn cultivator 3 times before sowing. • Spreading of FYM 3 weeks before sowing as available with farmers at least 7.5 tons/ha.

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 4 weeks 2nd week of July	Midland	Rice	Rice fallow Lehi system Line sowing method Early duration varieties Aditya(90days), Vanprabha(90 days), Poornima (105 days), Danteshwari (105 days). Samleshwari (110days).	• Herbicide like Fenoxaprep P. Ethyl 9 EC @ 60 ml. AI/ ha. Chlorimura+Metsulfuran 20%@ 4 gms. ai/ ha. Almix @8gm and whipsuper 250 ml dissolved in 10 ltrs of water for 1 acre./Butachlor 1.5 kg ai/ha PE. Weeding by upland weeder. • 60:40:30 N: P: K full dose of P & K and ½ dose of N should be applied basal remaining N should be top dressed at tillering and PI stage.	• Percolation tank should be excavated on the upper corner for recharge/ life saving irrigation. • Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation • Farm pond for water storage/

					irrigation.
	Lowland	Rice	Rice - Lehi system Line sowing method Poornima(105 days), Vanprabha(90 days), Danteshwari(105days). Madhuri(125 days) Pusa Basmati (130 days)	• Herbicide like Fenoxaprep P. Ethyl 9 EC @ 60 ml. a.i/ ha. Chlorimura+Metsulfuran 20%@ 4 gms. ai/ ha. Almix @8gm and whipsuper 250 ml dissolved in 10 l of water for 1 acre. /Butachlor 1.5 kg ai/ha PE. Weeding by lowland weeder. • 80:60:40 N: P: K full dose of P & K and ½ dose of N should be applied basal remaining N should be top dressed at tillering and PI stage.	• Percolation tank should be excavated on the upper corner for recharge/ life saving irrigation. • Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation
		Kodo millet	Kodo millet early variety like: JK-41 (90-100 days) JK-48 (90-105 days) GPUK-3 (90-105 days)	• 40:20 :10 N:P:K Kg/ha • Spraying of Isoproturon @ 0.5 kg ai /ha Pre emergence • Hand weeding 30 DAS • Thinning at 15 days after germination • Two intercultural operations at 15-20 DAS • Ploughing by tractor drawn cultivator 2 times before sowing • Spreading of FYM @ 5 t/ha 3 weeks before sowing	

		Finger millet	Finger millet improved variety like :VR-708 (80-84 days) PES-400(90-92days) GPU-66 HR-911 ML-365	• 50:40:25 N:P:K kg/ha • 50% of N and 100% of P and K at the time of sowing Remaining 50% N at 21 DAS • 12.5 kg /ha $ZnSO_4$ and 10 kg /ha soil application once in 3 years based on soil test result • Sowing across the slope • Opening of furrow at 10-15 m interval • Intercultural operations at 12 DAS and 21 DAS for thinning and removal of weeds • Ploughing by tractor drawn cultivator 3 times before sowing	
		Little millet	Little millet improved variety like : OLM-37 (80-82 days) OLM-203 (110-150 days) JK-8 (60-70 days) Birsa gundhali-1m(70-75 days) TNAU-63 (90-95 days) RPMB-1 (95-100 days)	• 40:20:10 N: P: K Kg/ha. • Spraying of Isoproturon @ 0.5kgai /ha Pre emergence • Hand weeding 30 DAS • Thinning at 15 days after germination • Two inter-cultural operations at 15-20 DAS • Ploughing by tractor drawn cultivator 2 times before sowing	

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 6 weeks 4th week of July	Midland	Rice	Kodo millet improved variety like : JK-41 (90-100 days) JK-48 (90-105 days) GPUK-3 (90-105 days)	•40:20 :10 N:P:K Kg/ha • Spraying of Isoproturon @ 0.5kg ai /ha pre emergence • Hand weeding 30 DAS • Thinning at 15 days after germination • Two intercultural operations at 15-20 DAS • Ploughing by tractor drawn cultivator 2 times before sowing • Spreading of FYM @ 5 t/ha 3 weeks before sowing	
		Finger millet	Finger millet improved variety like : VR-708 (80-84 days) PES-400(90-92days) GPU-66 HR-911 ML-365	• 50:40:25 N:P:K kg/ha • 50% of N and 100% of P and K at the time of sowing Remaining 50% N at 21 DAS	

				• 12.5 kg /ha $ZnSO_4$ and 10 kg /ha soil application once in 3 years based on soil test result • Sowing across the slope • Opening of furrow at 10-15 m interval • Intercultural operations at 12 DAS and 21 DAS for thinning and removal of weeds • Ploughing by tractor drawn cultivator 3 times before sowing	
		Little millet	Little millet improved varieties like : OLM-37 (80-82 days) OLM-203 (110-150 days) JK-8 (60-70 days) Birsa gundhali-1m(70-75 days) TNAU-63 (90-95 days) RPMB-1 (95-100 days)	• 40:20:10 N: P: K Kg/ha. • Spraying of Isoproturon @ 0.5kgai /ha Pre emergence • Hand weeding at 30 DAS • Thinning at 15 days after germination • Two inter-cultural operations at 15-20 DAS • Ploughing by tractor drawn cultivator 2 times before sowing	

	Lowland	Rice	Blackgram: Pant U -30 Barkha K.U. 96 -3 T. P. U. 4	• Hand weeding at 30 DAS • 40:20:10 N: P: K Kg/ha. • Ploughing by tractor drawn cultivator 2 times before sowing • Two intercultural operations at 15-20 DAS	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Change in crop/cropping system[c]**	**Agronomic measures[d]**	**Remarks on Implementation[e]**
Delay by 8 weeks 2nd week of August	Lowland	Niger	Niger improved varieties like : IGP-76(105-110 days) JNS-1 (90-100 days) JNS-6 (90-100 days)	• 20:20:10 N:P:K kg/ha • One hand weeding @15-20 DAS • Pendimethalin/ Alachlor @1.5 kg ai/ ha mix with 500 lit. water • Intercultural operations at 12 DAS and 21 DAS for thinning • Summer ploughing	

		Horsegram Local varieties used	Horsegram improved varieties like : V L G -1 V L G -8 Birsa Kulthi – 1 Bastar Kali B B H -1	• 20:40:30 NPK Kg /ha • One hand weeding 15-20@ DAS • 1-2 hand weeding • Intercultural operations at 12 DAS and 21 DAS for thinning • Summer ploughing • Sowing across the slope • Two inter culture operations at 20 and 40 DAS	

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Upland	Rice	• Foliar Spray of Urea 2-3 % solution in place of top dressing during moisture stress condition. • Life saving irrigation should be given so that crops can be saved.] • Gundhi Bug Control (Malathion+ DDVP@ 45ml + 5 ml) • Green leaf hopper (At	• In the standing crops the hand weeding should be done so that moisture remaining within soil may be conserved to the maximum extent possible.	

			PI stage BPMC @ 1 ml/litre of water)		
	Midland	Rice	Under Broadcasting situation *biasi* should be done at 30-35 DAS followed by *saghan chalai*	• Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation. • Percolation tank should be excavated on the upper corner for recharge/ life saving.	
	Lowland	Rice	• Life saving irrigation should be given so that crops can be saved. • If farmers want to do biasi operation, narrow sized plough should be used for biasi operation. Ploughing should be done at wider spacing. Chalai operation should be done immediately after biasi operation and plants should be uniformly distributed and fertilizers should be applied.	• Weedicide like Fenoxaprep P. Ethyl 9 EC should be used @ 60 ml. active ingredient/ ha. Chlorimuran+Metsulfuran 20 percent should be used @ 4 gms. Active ingredient/ ha. and application should be done in 500-600 litres of water.)	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**
At vegetative stage		Rice	• Foliar Spray of Urea 2-3 % solution in place of top dressing during moisture stress condition. • Life saving irrigation should be given so that crops can be saved. • Gundhi Bug Control (Malathion+ DDVP@ 45ml + 5 ml) • Green leaf hopper (At PI stage BPMC @ 1 ml/litre of water) • Under Broadcasting situation *biasi* should be done at 30-35 DAS followed by *saghan chalai*	• In the standing crops the hand weeding should be done so that moisture remaining within soil may be conserved to the maximum extent possible. • Trenches should be dug out on the upper side and lower side of field for *in situ moisture* conservation. • Percolation tank should be excavated on the upper corner for recharge/ life saving.	
		Rice	• Kodo Millet • Improved variety with	• Contour bunding on full length of field for	

			recommended dose of fertilizer • Two intercultural operations at 15-20 DAS • Spraying of Isoproturon @ 0.5kg ai /ha Pre emergence	interception of runoff • Hand weeding should be done.	
		Rice	• Little Millet • Improved variety with recommended dose of fertilizer • Life saving irrigation should be given so that crops can be saved. • Thinning at 15 days after germination	• Trenches should be dug out on the upper side and lower side of field for in situ moisture conservation. • Hand weeding should be done.	
	2) Farming situation:	Rice	• Finger Millet • Improved variety with recommended dose of fertilizer • Intercultural operations at 12 DAS and 21 DAS for thinning and removal of weeds • Application of isoproturon @ 0.5 kg a.i./ha pre-emergence	• Remaining 50% N in two splits at branching & PI stage • Sowing across the slope • One hand weeding at 25-30 DAS	
Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Soil nutrient & moisture conservation measues[d]**	**Remarks on Implementation[e]**

At flowering/ fruiting stage		Rice	• Finger millet • Improved variety with recommended fertilizer • Intercultural operations at 12 DAS and 21 DAS for thinning and removal of weeds • Remaining 50% N in two splits at branching & PI stage • One hand weeding at 25-30 DAS • Application of isoproturon @ 0.5 kg a.i./ha pre-emergence	• Sowing across the slope • One additional intercultural operation to conserve the moisture	
		Mango Sapota Guava	• Intercultural operations at 45 DAP and 60 DAP for thinning and removal of weeds	• Near root zones of the trees, one feet long and 2.5" diameter PVC pipe should be laid and as per water requirement of the plants, moisture/ water should be transferred to rootzone • Time to time, mulching around the plants should also be done.	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation[a]**	**Normal Crop/cropping system[b]**	**Crop management[c]**	**Rabi Crop planning[d]**	**Remarks on Implementation[e]**
		Rice	• Summer ploughing • Niger • Improved variety with recommended fertilizer • Intercultural operations at 12 DAS and 21 DAS for thinning • One hand weeding at 15-20 DAS	• Sowing across the slope • Pendimethalin/ Alachlor @1.5 kg ai/ha mix with 500 lit. water	
		Rice	• Horsegram • Improved variety with recommended fertilizer • 1-2 hand weeding. • Two inter culture operations at 20 and 40 DAS • Life saving irrigation should be given so that crops can be saved. • 20:40:20 NPK kg/ha full	• Sowing across the slope	

			dose at the time of sowing 15-20 DAS • 0.5 ml Calyxin (0.05 %) sprays to control powdery mildew.		
		Rice	• Horsegram • Improved variety with recommended fertilizer • Two intercultural operations at 12 DAS and 21 DAS for thinning • 1-2 hand weeding • Life saving irrigation should be given so that crops can be saved.	• 20:40:30 NPK Kg /ha • One hand weeding at 15-20 DAS • Sowing across the slope •Summer ploughing	

2.1.2 Drought - Irrigated situation

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Delayed release of water in canals due to low rainfall	Not applicable (NA)				

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Limited release of water in canals due to low rainfall	1) Farming situation:	NA			
	2) Farming situation:	NA			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Non release of water in canals under delayed onset of monsoon in catchment	1) Farming situation	NA			
	2) Farming situation	NA			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	1) Farming situation	NA			
	2) Farming situation	NA			

Condition			Suggested Contingency measures		
	Major Farming situation[f]	**Normal Crop/cropping system[g]**	**Change in crop/cropping system[h]**	**Agronomic measures[i]**	**Remarks on Implementation[j]**
Insufficient groundwater recharge due to low rainfall	1) Farming situation	NA			
	2) Farming situation:	NA			

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[k]**	**Flowering stage[l]**	**Crop maturity stage[m]**	**Post harvest[n]**
Rice	• Drainage of excess water, management of blast (tricyclozol 6 g/10 l of water) Do not apply urea as top dressing	• Drainage of excess water, management of blast (tricyclozol 6 g/10 l of water) and stem borer (Chlorpyriphos @ 1.5 ml/l of water)	Drainage of excess water,	Cover the harvested produce in farm yard.
Maize	• Drainage of excess water • Disease & pest management	• Drainage of excess water • Pest & disease management	• Drainage of excess water • Protection against pest & diseases	• Drainage • Shifting of produce to gowdon or safer place protecting from stored grain pest & disease
Horticulture				
Tomato	• Drainage of excess water	• Drainage of excess	• Drainage of excess water	• Drainage

	• Disease & pest management • Gap filling	water • Disease & pest management • Staking of plants	• Disease & pest management • harvesting	• Shifting produce to safer places • Grading & packing
Brinjal	• Excess water drainage • Disease & pest management	• Drainage of excess water • Disease & pest management • Staking of plants	• Drainage of excess water • Disease & pest management • harvesting	• Drainage • Shifting produce to safer places • Grading & packing
Mango	• Drainage of excess water • Disease & pest management	• Drainage of excess water • Pest & disease management	• Drainage of excess water • Protection against pest & diseases	• Drainage • Shifting produce to safer places • Grading & packing
Heavy rainfall with high speed winds in a short span[2]				
Rice	• Drainage of excess water • Management of blast (0.2% Edifelphos), leaf blight(0.01% streptocyclin) and stem borer (0.2% trizaphos)	• Drainage of excess water • Management of blast (0.2% Edifelphos), leaf blight(0.01% streptocyclin) and stem borer (0.2% trizaphos)	• drainage of excess water • Protection against pest like GLH & BPH (Imidachloprit 0.025%) and disease like Blast preventing crop from logging, harvesting in physiological maturity stage.	• Drainage • Shifting of produce to gowdon or safer place protecting from stored grain pest & disease
Maize	• Drainage of excess water • Disease & pest management • Earthing up to prevent logging	• Drainage of excess water • Pest & disease management	• Drainage • Protection against pest & diseases • Preventing crop logging & harvesting	• Drainage • Shifting of produce to gowdon or safer place protecting from stored grain pest & disease
Horticulture				
Tomato	• Drainage of excess water • Disease & pest management • Gap filling	• Drainage of excess water • Disease & pest	• Drainage of excess water • Disease & pest management • harvesting	• Drainage • Shifting produce to safer places

		management • Staking of plants		• Grading & packing
Brinjal	• Excess water drainage • Disease & pest management	• Drainage of excess water • Disease & pest management • Staking of plants	• Drainage of excess water • Disease & pest management • Preventing crop lodging • Harvesting of fruit	• Drainage • Shifting produce to safer places • Grading, packing & marketing
Mango	• Drainage of excess water • Disease & pest management •	• Drainage of excess water • Pest & disease management • Spraying of regulatory hormones like NAA to avoid flower drop	• Drainage of excess water • Protection against pest & diseases • Spraying of regulatory hormones like NAA to avoid fruit drop	• Drainage • Shifting produce to safer places • Grading packing & marketing
Outbreak of pests and diseases due to unseasonal rains				
Rice	• Management of blast (0.2% Edifelphos), leaf blight(0.01% streptocyclin) and stem borer (0.2% trizaphos)	• Management of blast (0.2% Edifelphos), leaf blight(0.01% streptocyclin) and stem borer (0.2% trizaphos)	• Protection against pest like GLH & BPH (Imidachloprit 0.025%) and disease like Blast preventing crop from logging, harvesting in physiological maturity stage. • Protect against grain discolouration	• Quick drying to prevent grain discolouration • Shifting of produce to gowdon or safer place protecting from stored grain pest & disease
Maize	• Spray imidachloprit 0.3 ml/l or Dimethoate 1.0 ml/l to control leaf hopper	• Foliar application of Mancozeb @0.25 - 0.4% at 8-10 days interval to control *Turcicum* leaf blight	• Trichoderma mixed with FYM @ 10 g/kg at 10 days prior to its use in the field can be applied to control stalk rot incidence which is likely during post flowering	-
Black Gram	-	• Foliar application of Carbendazim @ 0.5 g/l & sulphur @ 3 g/l against leaf spot &	-	-

		powdery mildew respectively		
Horticulture				
Mango	• Spray imidachloprit 0.3 ml or dimethoate 1 ml/l to control leaf hopper • Drench the seedlings with COC 0.3 % against root rot	• Spray imidachloprit 0.3 ml or dimethoate 1 ml/l to control leaf hopper	• Spray dithane M 45 2 g/l or Carbendazim 1 g/l against anthracnose • Spray sulphur 0.5% to control powdery mildew	• Maintain aeration in storage to prevent fungal infection & blackening of fruits

2.3 Floods

Condition	**Suggested contingency measure [o]**			
Transient water logging/ partial inundation[1]	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	Drain out the excess water at the earliest Apply booster dose of 50 kg N/ha Micronutrient deficiency correction for Zn & Fe foliar application of 0.2% ZnSO4, FeSO4 2-3 times at 4-5 days interval Maintain weed free condition	Drain out excess water at the earliest Take up gap filling either with available nursery or by splitting the tillers from the surviving hills Apply booster dose of 50 kg N/ha Spray ZnSO4 0.2% if it is less than 45 DAT	Drain out the excess water at the earliest Take up need based plant protection measures	Drain out water. Spread sheaves loosely in field or field bunds where there is no water stagnation. Spray common salt @ 5% on panicles to prevent germination and spoilage of straw from moulds. Thresh after drying the sheaves properly. Ensure proper grain moisture before storage
Horticulture				
Cashewnut				
Mango	Drain the excess water from orchard Spray urea 2% solution for	Drain the excess water from orchard Spray urea 2% solution for	Drain the excess water from orchard Spray urea 2%	Drain excess water as soon as possible Harvest the mature fruits

	2-3 times at 7-10 days interval	2-3 times at 7-10 days interval	solution for 2-3 times at 7-10 days interval	as soon as possible Store the fruit in well ventilated place temproraly before it can be marketed Market the fruit as soon as possible Spray dithane M 45 3% or bavistin 1% against anthracnose
Continuous submergence for more than 2 days[2]				
Horticulture				
Sea water intrusion[3]				

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

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave[p]				
Rice	○ Irrigating frequently	○ Increase irrigation frequency ○ Intercultural operation	○ Provide deficit irrigation ○ Quick harvesting to prevent moisture loss	○ Shifting the produce at shade and safe place
Maize	○ Frequent irrigation and mulching	○ Intercultural operation followed by frequent irrigation and mulching	○	○ Shifting the produce at shade and safe place
Greengram	○ Frequent irrigation	○ Increase irrigation frequency ○ Intercultural operation	○ Provide deficit irrigation ○ Quick harvesting to prevent moisture loss	○ Shifting the produce at shade and safe place
Horticulture				

Mango	○ Wind break ○ Growing in poly house watering twice daily	○ Shading to the small plants at field ○ Pitcher irrigation, Continuous irrigation with drip method	○ Wind break ○ Protective irrigation ○ Quick harvesting	○ Storing in cool dry place ○ Grading packing ○ Quick disposal for marketing
Cold wave[q]	NA			
Horticulture				
Tomato	• Raising of seedling in Poly house, resowing if damaged	• Disease and pest control, care for chilling injury or replanting	• Quick harvesting	• Grading, quick disposal for marketing
Potato	• Raising of seedling in Poly house, resowing if damaged	• Disease and pest control	• Harvesting, disease management	• Store in cold storage or quick disposal for marketing
Chilli	• Raising of seedling in Poly house, resowing if damaged	• Disease and pest control, care for chilling injury or replanting	• Harvesting, disease management	• Store in cold storage or quick disposal for marketing
Frost	NA			
Horticulture				
Hailstorm	NA			
Horticulture				
Cyclone	NA			
Horticulture				

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the event[s]	**During the event**	**After the event**
Drought			

Feed and fodder availability	Preservation of surplus fodder, encourage fodder cultivation and tree plantation and also encourage Supply of molasses to cattle feed plants.	Arrangement of feeds and fodder from adjoining areas, exploitation of non conventional feed resources, use of area treated straw and feed blocks.	Promotion of fodder seed production, cultivation and storage establishment of fodder block making machines in fodder surplus areas.
Drinking water	Repairs of tube wells, clear of the sludge in the canals and local water catchments and clean the water tanks, large ponds and lakes	Harvesting water through the existing reservoirs and exploitation of groundwater.	To strengthen reservoirs by promoting recharging of water and rain water harvesting during rainy season.
Health and disease management	Mass vaccination and deworming	Provide shades to animals and water as much as possible. Treatment of diseased animals and proper disposal of carcasses.	Treatment of diseased animals and provide vitamin and mineral supplement to regain strength and vigour.
Floods			
Feed and fodder availability	Conservation of the fodder in the form of hay and silage.	Feeding of feed blocks and silages	Provide treated feed and fodder to animals against moulds and fungi.
Drinking water	Regular inspection of ponds and canals for any obstruction.	Provide drinking water in small through and plastic bucket.	Disinfection of contaminated water especially for drinking purpose.
Health and disease management	Storage of medicines	Treatment of injured animals	Disposal of dead animals.
Cyclone	NA		
Feed and fodder availability	Stocking of feed and fodder in prone areas.	Feeding of stored feeds or blocks	Provide treated feed and fodder to animals
Drinking water	Storage of water in tanks	Use of stored water	Disinfection of contaminated water especially for drinking purpose.
Health and disease management	Storage of medicines	Treatment of injured animals	Disposal of dead animals
Heat wave and cold wave	NA		
Shelter/environment management	Construction of wind breaks, shed should have sufficient over hangs, fixing of sprinklers, provide thatch on the roof. Construction of wind breaks, keep	Construct wind breaks keep animals under shade during hot hours of the day, provide cooling fans in shades and also sprinkle water at regular intervals.	

	curtains ready, arrange for heating devices.	Construction wind breaks, put gunny bags on all openings of shed.	
Health and disease management		Grazing should be allowed during night and early hours of the day, vaccination and veterinary checkup time to time.	

[s] based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event[a]	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Storage of feed	Provide non conventional feed, supplement anti oxidant and anti stress		
Drinking water	Storage of water in tanks	Add vit-C and other anti stress ingredient with water		
Health and disease management	Regular vaccination	Vaccination and treatment of diseased one	Disposal of dead birds	
Floods				
Shortage of feed ingredients	Storage of feed in safe storage bins to avoid mould and fungi	Use pellet feeding		
Drinking water	Safe storage of water in tanks	Provide treated water		
Health and disease management	Regular vaccination	Vaccination and treatment of diseased one, proper litter management and addition of lime	Disposal of dead birds	

		as per need		
Cyclone	NA			
Shortage of feed ingredients	Storage of feed	Use stored feed carefully avoiding dampness		
Drinking water	Safe storage of water in tanks	Provide treated water		
Health and disease management		Vaccination and treatment of diseased one, proper litter management	Disposal of dead birds	
Heat wave and cold wave	NA			
Shelter/environment management	Construction of wind breaks, poultry shed should have sufficient over hangs fixing of sprinklers on the roofs, provide thatch on the roof, decrease stocking density, decrease litter depth. Construction of wind breaks, keep curtains ready, arrange for heating devices, increase stocking density, decrease litter depth.	Provide cooling fans in shades and also sprinkle water on the roof at regular intervals. Use of wind breaks, put gunny bags on all openings of shed, use heating devices.		
Health and disease management	Routine health care	Reduce energy content and increase protein content in feed, add anti stress factors, provide cool drinking water. Increase energy content in food		

[a] based on forewarning wherever available

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event[a]	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	1. Harvest all the large fish except the brood stock. 2. Move other fish into pens or small confined waters. 3. Provision for Rainwater harvesting 4. Deepening/Desilting of existing water bodies.	1. Harvest all the fish. 2. Stock water bodies with desirable species for culture. 3. Shallow derelict waters can stocked with stunted fish seed for culture. 4. Pens of 0.2 to 0.5 ha may facilitate easy operation of culture.	1. Stocking and management of grow out water bodies to improve growth of stock
(ii) Changes in water quality	1.Monitor water quality 2. Avoid polluting materials entry into water body.	1. Monitor water quality as small water bodies have less tolerance to environmental changes leading to algal blooms and fish mortality.	1. Advent of monsoon will mitigate the water shortage and normal stocking and culture practice may be adopted.
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	1. Harvest all the large fish except the brood stock. 2. Move other fish into pens or small confined waters with at least one meter depth.	1. Harvest all the fish. 2. Stock ponds with desirable species for culture. 3. Transfer the brood stock to deep water ponds if the existing	1. Start breeding operation with full preparations. 2. Undertake nursery and rearing operations. 3. Stocking and management of

	3. Go for low stocking density. 4. Provision for Rainwater harvesting 5. Deepening/Desilting of existing water bodies. 6. Removal of debris and compaction of pond bunds.	ponds cannot be filled with bore well water. 4. Postpone breeding operations till the first heavy rains or 5. Start breeding if sufficient bore well water is available. 6. Start pond preparations, like deweeding, desilting & repair of dykes.	grow out ponds to improve growth of stock.
(ii) Impact of salt load build up in ponds / change in water quality	1. Add bore well water and if available, canal-water	1. Add bore well/ canal water if available or else harvest the stock. 2. Implement standard water conservation management practices.	1. Exchange pond water with fresh surface runoff water.
2) Floods			
A. Capture			
Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No. of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality		1. Drainage of excess water need to be done. 2. Erect pens to protect the stock 3. Harvest big fish	1. Repair the embankments. 2. Restock with fish
(v) Health and diseases			1.Treat symptomatically

B. Aquaculture			
(i) Inundation with flood water	1. Dyke level shall be 0.5 m higher than highest flood level. Dyke walls should be checked for its strength specially compactness. 2. Inlets & outlets with proper sieves need to be maintained properly. 3. Pens may be erected to check fish stock loss in the periphery of small ponds.	1. Round the clock watch in is necessary. 2. Hapas should be installed in ponds to take care of spawn in case sudden or natural breeding occurs.	1. Check the brood stock condition. 2. Segregate male & female and various fish sizes. 3. Application of bleaching powder or liming must be done to avoid decaying of various organisms.
(ii) Water contamination and changes in water quality	-	1. Turbidity need to be controlled	1. Application of lime/ bleaching powder be done to avoid rotting and decaying of organisms.
(iii) Health and diseases	-	1. Apply lime/ bleaching powder as a prophylactic measure.	1. Apply bleaching powder. 2. Remove severely diseased & injured fishes. 3. Treat the remaining fishes as per symptoms.
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami	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	NA		
(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)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			

Inland	-	1. Harvest the stock.	1. Stock with fingerlings with the advent of rains.
B. Aquaculture			
(i) Changes in pond environment (water quality)	-	1. Add bore well water and if available, canal-water.	1. Exchange pond water with fresh surface runoff water.
(ii) Health and Disease management	-	1. Provide shelter (weeds) in a small area of the pond to prevent sun burn.	1. Remove weeds. 2. Liming or bleaching powder need to be added.
(iii) Any other			

[a] based on forewarning wherever available