

State: MAHARASHTRA

Agriculture Contingency Plan for District: AHMEDNAGAR

1.0 District Agriculture profile				
1.1	Agro-Climatic/Ecological Zone			
	Agro Ecological Sub Region (ICAR)	Deccan Plateau, Hot Semi-Arid Eco-Region (6.1)		
	Agro-Climatic Region (Planning Commission)	Western Plateau and Hills Region (IX)		
	Agro Climatic Zone (NARP)	Western Maharastra Scarcity Zone (MH-6)		
	List all the districts or part thereof falling under the NARP Zone	Scarcity Zone : Sangli, Nandurbar, Nasik, Dhule, Ahmednagar, Pune		
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude
		19°04'58.96" N	74°45'09.54" E	715.3 m MSL
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	ZARS, Krishak Bhavan, Near DAV College, Solapur, Pin 413001		
	Mention the KVK located in the district	Krishi Vidyan Kendra, Babhaleshwar (PIRENS) Tal: Rahata, Dist: Ahmednagar		
1.2	Rainfall	Normal RF (mm)	Normal Rainy days (number)	Normal Onset
				Normal Cessation
	SW monsoon (June-Sep):	419.0	25	2 nd week of June
	NE Monsoon (Oct-Dec):	111.7	14	-
	Winter (Jan- Feb)	8.1	5	
	Summer (March-May)	22.8	-	
	Annual	561.6	44	

1.3	Land use pattern of the district	Geographical area	Cultivable area	Forest area	Land under non – agriculture use	Permanent pastures	Cultivable wasteland	Land under misc. tree , crops and grooves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha)	1702.0	1146.3	163.4	13.9	41.7	19.1	3.4	131.0	89.4	93.8

(Source: Agricultural Statistical Information, Maharashtra State 2006 (Part II))

1.4	Area ('000 ha)
Major Soils	
Shallow grey soils	389.4
Medium deep black soils	142.7
Deep black soils	63.4

(Source : Strategic research and extension plan of Ahmednagar District)

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	1146.3	131.7
	Area sown more than once	363.4	
	Gross cropped area	1509.7	

1.6 Irrigation	Area ('000 ha)		
Net irrigated area	330.0		
Gross irrigated area	362.0		
Rainfed area	816.3		
Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
Canals	2	84.0	25.4
Tanks	-	-	-
Open wells	153138	246.0	74.5
Bore wells	121	-	-
Lift irrigation schemes	-	-	-
Micro-irrigation	-	-	-
Other sources (please specify)	-	-	-
Total Irrigated Area	-	330	100
Pump sets	15373	-	-
No. of Tractors	11645	-	-
Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	No. of blocks/ Tehsils 14	(%) area	Quality of water (specify the problem such as high levels of arsenic, fluoride, saline etc)
Over exploited	-		-
Critical	5	Good	-
Semi- critical	1	Good	-
Safe	8	Good	-
Wastewater availability and use	-		-
Ground water quality	-	Salty	-

1.7 Area under major field crops & horticulture (2008-09)

Sr. No.	Major field crop	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	
		Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Summer	Grand total
	<i>Rabi</i> Sorghum	-	-	-	-	507.2	507.2	-	507.2
	Wheat	-	-	-	138.2	-	138.2	-	138.2
	Sugar cane		-	-	113.7				133.7
	Pearlmillet	-	128.2	128.2	-	-	-	-	128.2
	Chickpea	-	-	-	-	--	90.5		90.5
	Soybean	-	55.5	55.5	-	-	-	-	55.5
	Horticulture crops - Fruits	Area ('000 ha)							
		Total							
	Pomegranate	6.4							
	Kagzi Lime	6.1							
	Guava	4.2							
	Mango	3.5							
	Sapota	3.1							
	Horticulture crops - Vegetables	Total							
	Onion	51.0							
	Tomato	3.7							
	Pea	2.4							
	Brinjal	2.3							
	Chilli	1.7							

(Source: Strategic Research and Extension Plan of Ahmednagar District)

Medicinal and Aromatic crops	Data not available
Plantation crops	Do

Fodder crops	Do
Total fodder crop area	Do
Grazing land	Do
Sericulture etc	Do

1.8 Livestock	Male ('000)	Female ('000)	Total ('000)
Non descriptive Cattle (local low yielding)	333.0	293.2	626.2
Crossbred cattle	88.9	599.7	688.6
Non descriptive Buffaloes (local low yielding)	19.5	141.7	161.3
Graded Buffaloes	4.5	33.0	37.6
Goat	255.5	800.1	1055.7
Sheep	67.4	327.5	394.9
Others (Camel, Pig, Yak etc.)	-	-	-
Commercial dairy farms (Number)	-	-	-
1.9 Poultry	No. of farms	Total No. of birds ('000)	
Commercial	0	399721	
Backyard	NA	NA	

1.10 Fisheries						
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)	
		NA	NA	NA	NA	NA
ii) Inland (Data Source: Fisheries Department)	No. Farmer owned ponds		No. of Reservoirs		No. of village tanks	
	-		79		822	

B. Culture			
	Water Spread Area (ha)	Yield (t/ha)	Production (‘000 tons)
i) Brackish water (Data Source: MPEDA/ Fisheries Department)	NA		
ii) Fresh water (Data Source: Fisheries Department)	13068	0.17	2225
Others	-	-	-

1.11 Production and productivity of major crops (Average of 2004, 05, 06, 07, 08, 09)

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										
	Pearlmillet	924	721	-	-	-	-	924	721	-
	Soybean	401	723	-	-	-	-	401	723	-
	Chickpea			657	726	-	-	657	726	-
	Rabi Sorghum	-	-	3278	646	-	-	3278	646	-
	Wheat			2192	1586	-	-	2192	1586	-
	Sugarcane	7622.59	67000	-	-	-	-	7622.5	67000	726
Major horticultural crops										
	Pomegranate	-	-	-	-	-	-	304.7	5000	-
	Kagzi lime	-	-	-	-	-	-	80	2500	-
	Mango	-	-	-	-	-	-	325.1	10000	-
	Sapota	-	-	-	-	-	-	160.8	5200	-
	Guava	-	-	-	-	-	-	301.4	15000	-

Major vegetable crops										
Onion	-	-	-	-	-	-	-	7647.45	15000	-
Tomato	-	-	-	-	-	-	-	72320	20000	-
Brinjal	-	-	-	-	-	-	-	30056	13000	-
Chilli	-	-	-	-	-	-	-	12068	7000	-
Pea	-	-	-	-	-	-	-	6060	2500	-

Source: CDAP, Ahmednagar

1.12	Sowing window for 6 major field crops	Soybean	Pearlmillet	Sugarcane	Wheat	Rabi Sorghum	Chickpea
	<i>Kharif</i> - Rainfed	15 th June to 15 th July	15 th June to 15 th July		-	-	-
	<i>Kharif</i> -Irrigated	15 th July to 25 th July	15 th June to 15 th July	Adsali (15 th July to 15 th Aug)	-	-	-
	<i>Rabi</i> - Rainfed	-	-		--	15 th September to 15 th October	15 th September to 25 th September
	<i>Rabi</i> -Irrigated	-	-	Preseasonal(15 th Oct to 15 th Nov) and suru (15 th Dec to 15 th Feb)	1 st November to 15 th November	--	20 th October to 10 th November

1.13	What is the major contingency the district is prone to?	Regular	Occasional	None
	Drought	--		--
	Flood	--	--	
	Cyclone	--	--	
	Hail storm	--	--	
	Heat wave	--	--	

	Cold wave	--	--	
	Frost	--	--	
	Sea water 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: No
		Soil map as Annexure 3	Enclosed: Yes

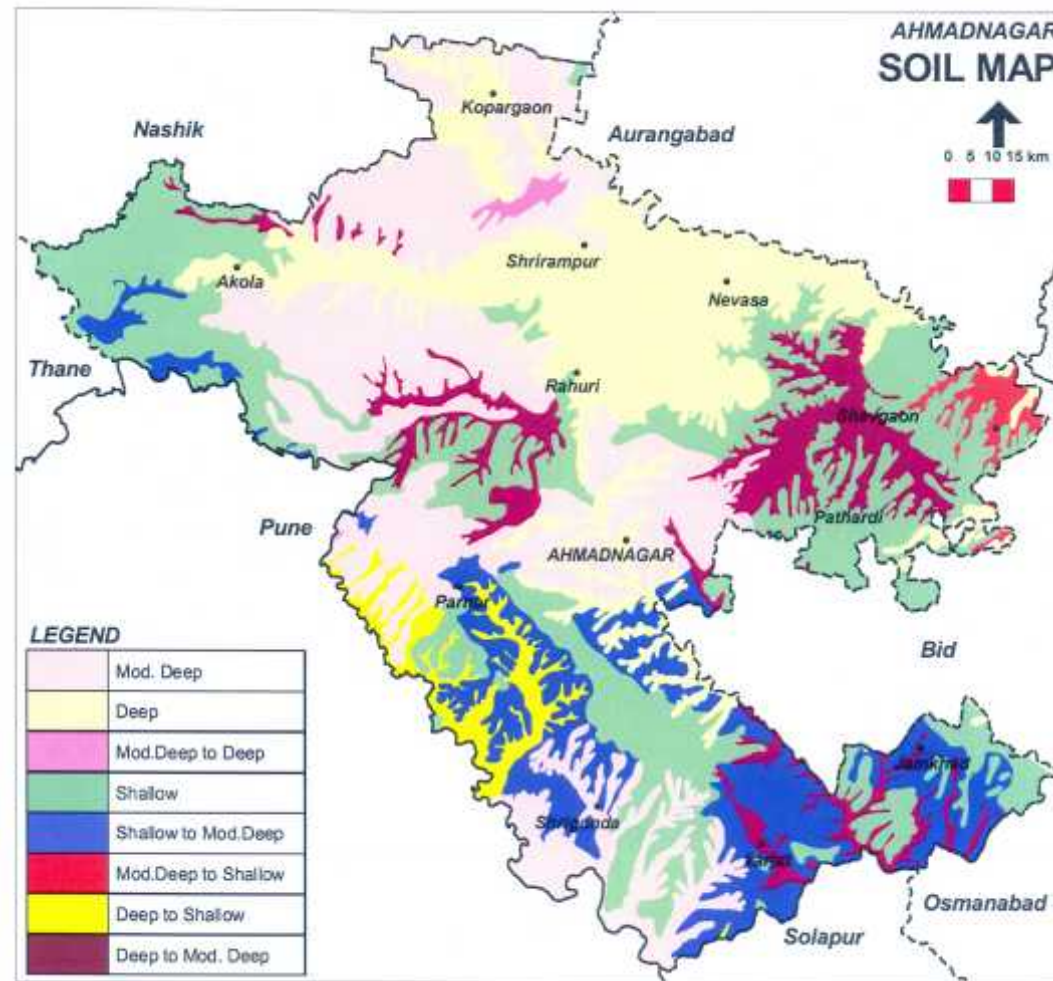
Annexure I

Salient Features of Agro-eco system Information of Scarcity Zone of Maharashtra



- 18 Districts
 - MPKV jurisdiction 94 tahsils
 - Total geographical area 108 lakh ha
 - One third area of State
- 114 Tahsils
MAU jurisdiction 20 tahsils
Cultivable area – 86 lakh ha

Annexure- III
Soil map (Source: NBSS& LUP, Nagpur)



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	Shallow grey soils	Pearlmillet	Pearlmillet (Shanti) Pearlmillet (Shanti) + Pigeonpea (Vipula) (2:1)	<ul style="list-style-type: none"> Basal application of 25 kg K₂O per ha for pearlmillet Two intercultivations 30 and 45 DAS 	Seed source MSSC, NSC and ARS, K. Digraj
June 4 th Week	Medium deep black soils	Soybean	<ul style="list-style-type: none"> Soybean(JS-9305,DS-228, JS-335), Soybean + Pigeonpea (Vipula) (6:2) intercropping 	<ul style="list-style-type: none"> Soybean seed treatment with Thiram + Carbendazim 2 g each / kg Treat pigeonpea seed with trichoderma 5 g per kg of seed 	ARS, Karad MPKV, Rahuri Private co. op Distributors
		Maize	African tall, Karveer, Rajarshee	Hoeing at 25 DAS	
		Onion	Phule Samarth, Baswant -780	Protective irrigation	
	Deep black soils	Soybean	<ul style="list-style-type: none"> Soybean Soybean + Pigeonpea (6:2) intercropping 	-do-	
		Onion	Phule Samarth, Baswant -780		

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 4weeks	Shallow grey soils	Pearlmillet	Pearlmillet (Shanti) Pearlmillet (Shanti) + Pigeonpea (Vipula) (2:1)	<ul style="list-style-type: none"> Basal application of 25 kg K₂O per ha for pearlmillet Two intercultivations 30 and 45 DAS 	Seed source MSSC, NSC and ARS, K. DigrajARS, Karad MPKV, Rahuri Private co. op Distributors
July 2nd Week	Medium deep black soils	Soybean	<ul style="list-style-type: none"> Soybean(JS-9305,DS-228, JS-335), Soybean + Pigeonpea (Vipula) (6:2) intercropping 	<ul style="list-style-type: none"> Soybean seed treatment with Thiram + Carbendazim 2 g each / kg Treat pigeonpea seed with trichoderma 5 g per kg of seed 	
		Maize	African tall, Karveer, Rajarshee	Hoeing at 25 DAS	
		Onion	Phule Samarth, Baswant -780	Protective irrigation	
	Deep black soils	Soybean	<ul style="list-style-type: none"> Soybean Soybean + Pigeonpea (6:2) intercropping 	-do-	
		Onion	Phule Samarth, Baswant -780		

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 6 weeks July 4 th week	Shallow grey soils	Pearlmillet	Pearlmillet for fodder (Gaint Bajra)	One hoeing and weeding before 30 DAS Increase nitrogenous fertilizer (25% dose)	Seed source : Central campus MPKV, Rahuri, College of Agril., Pune, Kolhapur

	Medium deep black soils	Soybean	Sunflower (SS-56 / Bhanu)	<ul style="list-style-type: none">• Hoeing at 30 DAS• Opening of conservation furrows in between two rows of sole sunflower for water / moisture	and Dhule NSC, MSSC, Private co. Distributors
		Maize	Maize (fodder -African tall)	Increase nitrogenous fertilizer (25% dose)	
		Onion	Fodder Sorghum (Phule Amruta / MP Chari / CSV-21F)	<ul style="list-style-type: none">• Application of 20: 20 N:P₂O₅ kg/ha as basal and remaining 20 kg N per ha at 30 DAS with sufficient soil moisture	
	Deep black soils	Soybean	Sunflower (SS-56 / Bhanu)	<ul style="list-style-type: none">• Hoeing at 30 DAS• Opening of conservation furrows in between two rows of sole sunflower for water / moisture	
		Onion	Fodder Sorghum (Phule Amruta / MP Chari / CSV-21F)	<ul style="list-style-type: none">• Application of 20: 20 N:P₂O₅ kg/ha as basal and remaining 20 kg N per ha at 30 DAS with sufficient soil moisture•	
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 8 weeks August 2 nd week	Not Applicable for this district				

Condition			Suggested Contingency measures
------------------	--	--	---------------------------------------

Early season drought (Normal onset)	Major farming situation	Normal crop / cropping system	Crop management	Soil nutrient & moisture conservation measure	Remarks on Implementation
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Shallow grey soils	Pearlmillet	--	Hoeing at 20 DAS and weeding at 30 DAS	Seed source : Central campus MPKV, Rahuri, ARS, Mohol ZARS, Solapur NSC MSSC NRCS, Solapur MAU, Parbhani
	Medium deep black soils	Soybean	In case of less than 30 % germination takes up resowing with wider spacing of 45 cm with sufficient soil moisture.	Hoeing at 25 DAS	
		Maize	Gap filling / Resowing	Hoeing at 25 DAS	
		Onion	-	Protective irrigation through sprinkler	
	Deep black soils	Soybean	In case of less than 30 % germination take up resowing with wider spacing of 45 cm with sufficient soil moisture	Hoeing at 25 DAS	
		Onion	--	Protective irrigation through sprinkler	

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 measure	Remarks on Implementation
At vegetative stage	Shallow grey soils	Pearlmillet	--	Hoeing/Weeding Use of 8 % kaolin spray	-do-
	Medium deep black soils	Soybean	Protective irrigation	2 % urea spray, Hoeing and weeding	
		Maize	-do-	-do-	

		Onion	-do-	2% urea spray	
	Deep black soils	Soybean	-do-	-do-2 % urea spray, Hoing and weeding	
		Onion	-do-	-do-	

Condition			Suggested contingency measures		
Mid season drought (long dry spell)	Major Farming situation	Normal crop/cropping system	Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At flowering/ fruiting stage	Shallow grey soils	Pearlmillet	Protective irrigation	• Use of 8 % kaolin spray	
	Medium deep black soils	Soybean	Protective irrigation, hoeing, mulching	-do-	
		Maize	-do-	-do-	
		Onion	Protective irrigation	--	
	Deep black soils	Soybean	Protective irrigation	--	
		Onion	Protective irrigation	--	

Condition			Suggested contingency measures		
Terminal drought (Early withdrawal of monsoon)	Major Farming situation	Normal Crop/cropping system	Crop management	<u>Rabi</u> Crop planning	Remarks on Implementation
	Shallow grey soils	Pearlmillet	In case of poor grain filling harvest for fodder	No rabi crop	-do-
	Medium deep black soils	Soybean	Protective irrigation	Chickpea (Vijay / Digvijay) / Safflower (Bhima) / Sunflower (SS-56)	
		Maize	-do-	Chickpea (Vijay / Digvijay) / Safflower (Bhima) / Sunflower (SS-56)	

		Onion	-do-	Chickpea (Vijay / Digvijay) / Safflower (Bhima) / Sunflower (SS- Chickpea (Vijay / Digvijay) / Safflower (Bhima) / Sunflower (SS-56)	
	Deep black soils	Soybean	-do-	Wheat (Tapovan , Trimbak, Godavari)	
		Onion	-do-	Wheat (Tapovan , Trimbak, Godavari)	

2.1.2 Drought - Irrigated situation

Condition			Suggested contingency measures		
Delayed release of water in canals due to low rainfall	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
	Shallow grey soils	Rabi-Sorghum	No change	Phule Anuradha, Phule Vasudha, Maldandi Protective irrigation	Seed source : Central campus MPKV, Rahuri, College of Agril., Pune, Kolhapur and Dhule
	Medium deep black soils	Wheat	Wheat (Tapovan , Trimbak, Godavari) and /Chickpea (Vijay, Digvijay, Virat)	In wheat , irrigate at critical stages	NSC, MSSC,
		Maize	African tall, Rarshee, Karveer	Sowing on ridges and furrows	
		Onion	Phule samarth, N-2-4-1	Sprinkler irrigation	
		Chickpea	Vijay, Digvijay, Virat,	As above	
	Deep black soils	Sugarcane	No change	Alternate furrow irrigation/ Trash mulching	

Condition			Suggested contingency measures
-----------	--	--	--------------------------------

	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Major farming situation	Normal crop/cropping system
Limited release of water in canals due to low rainfall	Shallow grey soils	Rabi-Sorghum	No change	Phule Anuradha, Phule Vasudha, Maldandi Protective irrigation	Seed source : Central campus MPKV, Rahuri, College of Agril., Pune, Kolhapur and Dhule NSC, MSSC,
	Medium deep black soils	Wheat	Wheat (Tapovan , Trimbak, Godavari) and /Chickpea (Vijay, Digvijay, Virat)	In wheat , irrigate at critical stages	
		Maize	African tall, Rajrshee, Karveer	Sowing on ridges and furrows	
		Onion	Phule samarth, N-2-4-1	Sprinkler irrigation	
		Chickpea	Vijay, Digvijay, Virat,	As above	
	Deep black soils	Sugarcane	No change	Alternate furrow irrigation/ Trash mulching	

Condition	Suggested contingency measures				
	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Major farming situation	Normal crop/cropping system
Non release of water in canals under delayed onset of monsoon in catchments area	NA				

			Suggested contingency measures
--	--	--	--------------------------------

Condition	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Major farming situation	Normal crop/cropping system
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Such condition is not available				

Condition	Suggested contingency measures				
	Major farming situation	Normal crop/cropping system	Change in crop/cropping system	Major farming situation	Normal crop/cropping system
Insufficient groundwater recharge due to low rainfall	Shallow grey soils- Open well irrigated	Rabi Sorghum	-	Protective irrigation	
	Medium deep black soils-- Open well irrigated	Wheat	Majorly wheat (Godavari, Tapovan, Trimbak) and / Chickpea (Vijay, Digvijay, Virat)	In wheat -Irrigate at critical growth stages. In chickpea - Sprinkler irrigation	
		Onion	No change	Micro Sprinkler irrigation	
		Maize	Maize – Rajrshree, Karveer or Chickpea (Vijay, Digvijay, Virat)	Sowing on ridges and furrows Sprinkler irrigation	
		Chickpea	Vijay, Digvijay, Virat	Sprinkler irrigation	
	Deep black soils -- Open well irrigated	Sugarcane	No change	Drip irrigation, Paired row planting, alternate furrow irrigation & trash mulching	

2.2 Unusual rains (untimely, unseasonable etc)

Condition	Suggested contingency measure			
Continuous high rainfall in a short span leading to water logging	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
Pearlmillet	Drain out excess water Give second dose of N at optimum soil moisture	Drain out excess water	Harvest at physiological maturity stage	Shift produce to safer place for drying
Soybean	As above	As above	As above	As above
Maize	As above	As above	As above	As above
Onion	As above	As above	As above	As above
Sugarcane	As above	As above	As above	As above
Horticulture				
Grape	Drain out excess water			
Banana	<ul style="list-style-type: none"> • Draining out excess water • Cleaning and maintenance • Drenching of orchard – Copper fungicides • Spraying with 2% urea and application of fertilizers after flood 			
Pomegranate	<ul style="list-style-type: none"> • Draining out excess of water from the orchads and basins • Cleaning and maintenance of the basins • Drenching of orchard –Copper fungicides • Treating the stems - 10% Bordeaux paste, Geru paste with systemic insecticide • Spraying with 2% urea 			
Mango	Drain out excess water	Drain out excess water	Harvest at physiological maturity	Cold storage or immediate marketing

Heavy rainfall with high speed winds in a short span				NA
Outbreak of pests and diseases due to unseasonal rains				
Pearlmillet	Insect pest :	Insect pest :	Disease:	-
	Grass hopper-Dusting of 2 % methyl parathion	Blister beetle- Dusting of 2 % methyl parathion 20 kg/ ha	Ergot : Seed treatment with 20% brine solution	

Soybean	<p>Diseases:</p> <p>Leaf spot: Spray Maconzeb 75 WP 0.25%</p> <p>Root rot/collar rot- Treat seed with carbendazim + mancozeb (2 g /kg) or Phule Trichoderma 5 g/kg.</p>	<p>Insect pest :</p> <p>Pod borer: Chlorpyrifos 20 % 2 ml of water</p> <p>Diseases: Rust –</p> <ul style="list-style-type: none"> • Early sowing in last week of may • Use of disease resistant variety (DS-228) • Spraying the crop with Propiconazole @ 0.1% 	-	-
Sugarcane	<p>Insect pests:</p> <p>Stem Borer: Soil application of 10 G Phorate 20 kg/ha or 20% Chloropyrifos @5 lit in 1000 lit of water through water channel</p> <p>White fly : Malathion 50 % @ 2 ml / L of water</p>	<p>Insect pests:</p> <p>Top shoot borer: Soil application of 10 G Phorate @ 20 kg/ha or 20% Chloropyrifos @5 lit in 1000 lit of water through water channel</p> <p>White Wooly aphid: Phorate 10G @15 kg/ha, or spray Methyl demeton 25 EC @ 1.5 ml/L or Diamethoate 30% @1.5ml/L</p>	-	-
Onion	<p>Insect : Thrips : Profenophos @2 ml/ L</p> <p>Disease: Alternaria/ Cercospora : Mancozeb spray 0.25 % or 0.1 % Carbendazim or 0.25 % chlorothalonil</p>	-	-	-
Horticulture				
Grape	<p>Insect:</p> <p>Mealy bug: Use sticky traps on trunk and girdle. Spray Malathion 50 EC @ 2 ml / L</p>	<p>Disease:</p> <p>Powdery mildew : 80 % wettable sulphur @ 2 g / L of water</p>	-	-

	Verticylum lecani 25 g /10 L of water			
Pomegranate	<p>Insect:</p> <p>Short hole borer : 400 g Geru + 2.5 ml lindane (20 EC) + 2.5 g COC mix together and paste should be applied to branches</p>	<p>- Such as – Pests - stem borer, thrips, aphids, nematodes</p> <p>Diseases – Sigatoka, bunchy top, cigar end rot, erwinia rot</p> <p>Remedies</p> <ul style="list-style-type: none"> • Cleaning and maintenance of the orchads • Drain out excess water from the orchads • Drenching with 0.4 % copper fungicides • Staking with available material • Sanitation of the affected plants <ol style="list-style-type: none"> 1. Spray the crops with 0.20 to 0.25 % copper fungicide for control of fungal diseases. 2. Drench 200 ml of solution (15 g Streptocycline + 300 g COC + 300 ml Chlorpyriphos in 100 L of water) per plant. 3. Spraying with Imidachloprid 17.8 SL @ 3-4 ml/ 10 L of water for control of sucking pests. <p>Nematodes management</p> <p>Soil application of Phorate 10 G @ 40 g / basin and Neem cake @ 1- 1.5 kg / basin. Planting of marigold around the pomegranate plants and deep summer ploughing</p>	-	-
Mango	<p>Insect:</p> <p>Hoppers: Cypermetrin 25 EC @ 0.3 ml / L</p>	<p>Diseases-Powdery mildew- Spray wettable sulphur 80 WP 0.2 % or dust 300 mesh sulphur @ 20 kg/ha.</p> <p>Insect Pests-Hoppers: 50 % carbaryl spray @ 2 g/L or 10 % carbaryl dust @ 20 kg /ha</p>	-	-

2.3 Floods : Not applicable

2.4 Extreme events: Heat wave / Cold wave/Frost/ Hailstorm /Cyclone: Not applicable

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	<p>Motivating the sugarcane and maize farmers to convert green sugarcane and maize tops in to silage by the end of February</p> <p>Sowing of cereals (Sorghum/ Maize/Bajra) and leguminous crops (Lucerne, Horse gram, Cowpea) during North-East monsoon under dry land system for fodder production.</p> <p>Preserving the Groundnut haulms and soya husk as supplemental fodder during drought</p> <p>Establishment of fodder bank at village level with available dry fodder (Sorghum/Bajra stover/wheat and paddy straw)</p> <p>Development of silvopastoral models with Leucaena, Glyricidia, Prosopis as fodder trees and Marvel, Madras Anjan, Stylo, Desmanthus, etc., as under storey grass</p> <p>Encourage fodder production with fodder varieties of Sorghum – stylo- Sorghum on rotation basis and also to cultivate short-term fodder crops like sunhemp</p> <p>Formation of village Disaster Management Committee</p> <p>Capacity building and preparedness of the stakeholders and official staff for the drought/floods</p>	<p>Harvest and use biomass of dried up crops (Sorghum/Bajra,/maize/Chikpea/wheat/Soybean etc.,) material as fodder</p> <p>Use of unconventional and locally available cheap feed ingredients especially Groundnut cake and haulms for feeding of livestock during drought</p> <p>Harvest all the top fodder available (Subabul, Glyricidia, Pipol, Prosopis etc) and feed the LS during drought</p> <p>Concentrate ingredients such as Grains, brans, chunnies & oilseed cakes, low grade grains etc. unfit for human consumption should be procured from Govt. Godowns for feeding as supplement for high productive animals during drought</p> <p>Promotion of cultivation of Lucerne,Horse gram as contingent crop and harvesting it at vegetative stage as</p>	<p>Encourage progressive farmers to grow multi cut fodder crops of sorghum/bajra/maize(UP chari, MP chari, HC-136, HD-2, GAIN T BAJRA, L-74, K-677, Ananad/African Tall, Kisan composite, Moti, Manjari, B1-7 on their own lands with input subsidy</p> <p>Supply of quality seeds of Stylo and fodder slips of Marvel, Yaswant, Jaywant, napier, guinea grass well before monsoon</p> <p>Flushing the stock to recoup</p> <p>Replenish the feed and fodder banks</p>

		<p>fodder</p> <p>All the hay should be enriched with 2% Urea molasses solution or 1% common salt solution and fed to LS.</p> <p>Continuous supplementation of minerals to prevent infertility.</p> <p>Encourage mixing available kitchen waste with dry fodder while feeding to the milch animals</p> <p>Arrangements should be made for mobilization of small ruminants across the districts where no drought exits</p> <p>Unproductive livestock should to be culled during severe drought</p> <p>Create transportation and marketing facilities for the culled and unproductive animals (10000-20000 animals)</p> <p>Subsidized loans (5-10 crores) should be provided to the livestock keepers</p>	
Drinking water	<p>Adopt various water conservation methods at village level to improve the ground water level for adequate water supply.</p> <p>Identification of water resources</p> <p>Desilting of ponds</p> <p>Rain water harvesting and create water bodies/watering points (when water is scarce use only as drinking water for animals)</p> <p>Construction of drinking water tanks in herding places/village junctions/relief camp locations</p> <p>Community drinking water trough can be arranged in shandies /community grazing areas</p>	<p>Adequate supply of drinking water.</p> <p>Restrict wallowing of animals in water bodies/resources</p> <p>Add alum in stagnated water bodies</p>	<p>Watershed management practices shall be promoted to conserve the rainwater.</p> <p>Bleach (0.1%) drinking water / water sources</p> <p>Provide clean drinking water</p>
Health and disease management	<p>Procure and stock emergency medicines and vaccines for important endemic diseases of the area</p> <p>All the stock must be immunized for endemic diseases of the</p>	<p>Carryout deworming to all animals entering into relief camps</p>	<p>Keep close surveillance on disease outbreak.</p>

	<p>area</p> <p>Surveillance and disease monitoring network to be established at Joint Director (Animal Husbandry) office in the district</p> <p>Adequate refreshment training on draught management to be given to VAS, Jr.VAS, LI with regard to health & management measures</p> <p>Procure and stock multivitamins & area specific mineral mixture</p>	<p>Identification and quarantine of sick animals</p> <p>Constitution of Rapid Action Veterinary Force</p> <p>Performing ring vaccination (8 km radius) in case of any outbreak</p> <p>Restricting movement of livestock in case of any epidemic</p> <p>Tick control measures be undertaken to prevent tick borne diseases in animals</p> <p>Rescue of sick and injured animals and their treatment</p> <p>Organize with community, daily lifting of dung from relief camps</p>	<p>Undertake the vaccination depending on need</p> <p>Keep the animal houses and milking sheds clean and spray disinfectants</p> <p>Farmers should be advised to breed their milch animals during July-September so that the peak milk production does not coincide with mid summer</p>
Insurance	Encouraging insurance of livestock	Listing out the details of the dead animals	<p>Submission for insurance claim and availing insurance benefit</p> <p>Purchase of new productive animals</p>

*based on forewarning wherever available

2.5.2 Poultry

	Suggested contingency measures		
	Before the event	During the event	After the event
Drought			
Shortage of feed ingredients	Storing of house hold grain like maize, broken rice etc, in to use as feed in case of severe drought	<p>Supplementation only for productive birds with house hold grain</p> <p>Supplementation of shell grit (calcium) for laying birds</p> <p>Culling of weak birds</p>	Supplementation to all survived birds

Drinking water		Use water sanitizers or offer cool hygienic drinking water	
Health and disease management	Culling of sick birds. Deworming and vaccination against RD and IBD	Mixing of Vit. A,D,E, K and B-complex including vit C in drinking water (5ml in one litre water)	Hygienic and sanitation of poultry house Disposal of dead birds by burning / burying with lime powder in pit

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	During the event	After the event
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow	<ol style="list-style-type: none"> 1. Proper planning of water storage 2. Conservation & development of water resources by construction of reservoirs & dams. 3. Avoid seepage losses by lining the canals. 4. Adopt rain water harvest techniques. 5. Farmer's organizations, water users & private sectors should be involved in construction, operation & maintenance of irrigation system. 6. To make people aware about conservation of water. 	<ol style="list-style-type: none"> 1. Maintenance of dams & reservoirs to avoid leakage & to control theft of water. 2. Proper use of water resources on priority base. 3. Add water in shallow water pond. 4. Use stored water. 5. Use surface water flow. 6. Divert water from unutilized areas. 7. Utilize canal water. 8. Aeration of water in ponds/reservoirs. 	<ol style="list-style-type: none"> 1. Regular desiltation of reservoirs & dams. 2. Govt. should make laws on water conservation. 3. To develop demand oriented system. 4. Govt. should make laws to stop deforestation. 5. Need based monitoring through research plan. 6. Intensive forestation program. 7. Augmentation of surface water flow. 8. Strengthening of water reservoirs. 9. Rain water harvesting . 10. Compensation claims. 11. Prepare vulnerability map and place it to management committee

	<ol style="list-style-type: none"> Critical analysis of long range a Forecast data. Storage of water. A forestation program. Conservation of rivers/reservoir/ponds. Re-excavation of local canals and reservoirs. 		
(ii) Changes in water quality	<ol style="list-style-type: none"> Storage of water disinfectant such as chlorine, alum etc. at district level. Prohibit dumping of solid, liquid and waste in water sources. Preparedness with stocks of chemicals, disinfectants and therapeutic drugs. 	<ol style="list-style-type: none"> Provision of water filtration system for the ponds to overcome the water contamination- Use disinfectants and therapeutic drugs. Adoption of bio-remedial measures 	<ol style="list-style-type: none"> Removal of runoff from land by proper means before decomposition. Supply of water filtration system even after the event & creating awareness in farmers. Need based research data should be generated on water quality. Dumping of solid, liquid and waste in water bodies should be stopped through enactment of legislation.
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	<ol style="list-style-type: none"> Available resources will be identified and need to be kept ready for each district on the basis of forecasting of insufficient rain. To avoid loss due to seepage, infiltration & leakage by using bentonite, ash, polythene liners etc. Maintain the level of water by pumping water into pond. Critical analysis of long range Forecast data. Storage of water. A forestation program. Conservation of rivers/reservoir/ponds. Re-excavation of local canals and 	<ol style="list-style-type: none"> Water resources of the areas will be exploited with planning of proper transport facilities in affected areas. Maintain the level of water to the required depth. Add stored water in shallow water depth. Harvesting of fishes as early as possible to avoid mortality. Use stored water. Use surface water flow. Divert water from unutilized areas. Utilize canal water. Aeration of ponds 	<ol style="list-style-type: none"> Available resources need to be listed with adequate transport arrangement. Desiltation of pond bottom. Maintenance of tanks & ponds Need based monitoring through research plan. Intensive a forestation program. Augmentation of surface water flow. Construction of water reservoirs. Adoption of rain harvesting methods. Compensation claims . Prepare vulnerability map and place it to management committee

	reservoirs.		
(ii) Impact of salt load build up in ponds / change in water quality	<ol style="list-style-type: none"> 1. Minimize evaporation losses. 2. Dilution of water if salt load is high. 3. Available resources will be identified & need to be kept ready for each district on the basis of forecasting of insufficient rain to reduce the salinity by trapping available water resources. 4. On the basis of forecasting advising fish farmers for harvesting of marketable fish. 5. Prohibit dumping of solid, liquid and waste in water sources. <p>Preparedness with stocks of chemicals, disinfectants and therapeutic drugs</p>	<ol style="list-style-type: none"> 1. Dilution of water or exchange water to avoid salt builds up. 2. Harvesting the marketable fish to reduce the density. 3. Use disinfectants and therapeutic drugs. <p>Adoption of bio-remedial measures</p>	<ol style="list-style-type: none"> 1. Trapping the water resources from other places for dilution to reduce salt load. 2. Need based research data should be generated on water quality. 3. Dumping of solid, liquid and waste should be stopped through enactment of legislation.

(iii) Any other			
2) Floods			
A. Capture			
Marine			
Inland			
(i) Average compensation paid due to loss of human life	<ol style="list-style-type: none"> 1. Fishermen will be given forewarning regarding heavy rains and advised not to go for fishing in rivers/reservoirs. 2. Areas need to be identified in each district prone for flood. 3. Maintenance of water drainages in proper way to avoid blockage. 4. Proper forecasting information should be available. 	<ol style="list-style-type: none"> 1. Fishermen will be advised on use of Life saving jackets and life boats. The life saving appliances/machinery shall be kept ready for rescue operation. 2. Sufficient stock of food, medicine etc. should be available. 3. Govt. should take necessary action & provide trained people for rescue operation during flood. 4. Human evacuation from the area. 5. Coordination of assistance. 	<ol style="list-style-type: none"> 1. The victim's family shall be provided with compensation up to Rs. 1, 00,000/- for the deaths occurring during the fishing. 2. Rehabilitation of people. 3. Identify the causes of flood affected area & take necessary preventive measures. 4. Arrangement for rescue and casualty care. 5. Arrangement for burial control room. 6. Restoration of essential services, security and protection of property.

	<ol style="list-style-type: none"> 5. Be prepared to evacuate at a short notice. 6. Preparation of flood control action plan. 7. Warning dissemination and precautionary response. 8. Formation of flood management committee. 9. Enhancement in coping capabilities of common people. 10. Insurance for the life of people/fishermen. 	<ol style="list-style-type: none"> 6. Damage and need assessment. 7. Immediate management of relief supplies. 8. Immediate help delivery. 	<ol style="list-style-type: none"> 7. Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan. 8. Insurance and compensation claim.
(ii) No. of boats / nets/damaged	<ol style="list-style-type: none"> 1. The prior information on safe keeping of boats and nets will be provided to the fishermen. 2. If prior information is given bring boats & nets towards the safer side. 3. Annual repair of boats/nets and gears. 4. Insurance of boats/nets/gears. 	<ol style="list-style-type: none"> 1. Fishermen will be advised to stop fishing during the floods and heavy rainfall. 2. Continuous monitoring on water level is required. 3. Coordination of assistance 4. Immediate management of relief supplies. 5. Govt. support and compensation. 	<ol style="list-style-type: none"> 1. The affected fishermen will provided with compensation up to Rs. 50,000/- for damaged boats or nets. 2. Education and training for the repair of boats/nets and gears. 3. Loss assessment & insurance claim.
(iii) No.of houses damaged	<ol style="list-style-type: none"> 1. Forewarning regarding heavy rainfall, sudden downpour and floods will be spread in the fishermen villages on the banks of rivers. 2. Shift the people to safer places. 3. Proper maintenance of <i>Kaccha</i> houses. 4. Education and training for the repair of houses 5. Store raw material for emergency repair of houses. <p>House insurance</p>	<ol style="list-style-type: none"> 1. Temporary shelter to the affected families will be provided. 2. Arrangement of temporary shelters for homeless people. 3. Damaged house enumeration and need assessment. 4. Coordination of assistance. 5. Immediate management of relief supplies. 	<ol style="list-style-type: none"> 1. The housing facilities on higher elevation shall be provided to affected families by the Government agencies. 2. Provide compensation from Govt. to build/repair houses. 3. Loss assessment & insurance claim. 4. Govt. assistance claim.

(iv) Loss of stock	<ol style="list-style-type: none"> 1. Harvesting the existing fish stock 2. Keep boats, nets/gears ready for emergency use. 3. Store fuels, food/other item 4. Develop flood control management plans. 5. .Stock material insurance. 	<ol style="list-style-type: none"> 1. Search/locate the tock/input. 2. Mobilize local people for protection. 3. Hire stock/inputs from distant areas/company/ farmers who are not affected by flood 	<ol style="list-style-type: none"> 1. Provided subsidy on seeds by Govt. 2. Implementation of Insurance policy. 3. Locate backup stocks and verify its usability time. 4. Follow flood control management plan. 5. Notify utilities of the critical demand about loss of stock and inputs. 6. Loss assessment & insurance claim.
(v) Changes in water quality	<ol style="list-style-type: none"> 1.Storage of water disinfectant such as chlorine, alum etc. at district level. 2. Provision to stop/close the effluent/sewerage discharge point in water odies 3. Store chemicals, disinfectants and therapeutic drugs. 4. Develop flood control management plan. 	<ol style="list-style-type: none"> 1.Provision of water filtration system for the ponds to overcome the water contamination- 2. Do not use contaminated water 3. Proper preparation and management through emergency aeration. 4. Use appropriate amount of disinfectants, chemicals and therapeutic drugs. 5. Immediate support of Govt./industrial organizations for maintaining the purity and quality of water bodies. 6. Need based bioremediation 	<ol style="list-style-type: none"> 1.Removal of runoff from land by proper means before decomposition. 2.Supply of water filtration system even after the event & creating awareness in farmers. 3. Need based research data should be generated to maintain water quality, 4. Dumping of solid, liquid and waste should be stopped through enactment of legislation. 5. Contact Govt. and industrial organization for immediate remedy and cleaning of the water bodies. 6. Regular water monitoring and bio-monitoring of water bodies for formulation of management plan
(vi) Health and diseases	<ol style="list-style-type: none"> 1. Water filtration system & control measures for diseases should be available. 2. Advance planning and preparedness. 3. Store chemicals, disinfectants and therapeutic drugs. 4. Stock sufficient stores of medicines 	<ol style="list-style-type: none"> 1.Periodical checking particularly with respective fish mortality should be done during flood & dead fishes disposed properly. 2. Prompt action or immediate removal of disease causing agents/ dead fish, followed by sterile or landfill disposal. 3. Use appropriate amount of disinfectants, chemicals and therapeutic drugs. 4. Emergency aeration or splashing in water bodies. 	<ol style="list-style-type: none"> 1.Setting health & disease management training centre at district level for fisherman community by Govt. or with the help of NGO. 2. Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread. 3. Eradicating the disease where possible. 4. Follow up surveillance and monitoring after disease outbreak. 5. Need based research data should be generated. 6. Loss assessment & insurance claim.

B. Aquaculture			
(i) Inundation with flood water	<ol style="list-style-type: none"> 1. In the flood prone areas proper draining system from ponds need to be developed and planned in flood situation before forecasting of flood. 2. Site should be away from flood prone area. 3. Dyke should be stable in all weather condition & not liable to collapse during heavy rains. 4. Proper channels to be provided to pass surplus water & to avoid breakage to the bundh. 5. Proper facility construction for ponds and its stock safety. 6. Development of flood control management plan. 7. Preparedness with emergency backup equipment on site. 8. Stock insurance. 9. Preventive measures against entry of alien/wild organisms through flood water. 	<ol style="list-style-type: none"> 1. On the basis of forecasting information to farmers for sale of marketable fish with sufficient transport facility through various media. Proper drainage should be adopted so that inundation with flood water should be minimized. 2. On the basis of forecasting, information to farmers for sale of marketable fish with sufficient transport facility through various media. 3. Proper drainage should be adopted so that inundation with flood water should be minimized. Excess water should be drained from pond by providing screen outlets or using pumps. 4. Arrangement for evacuation. 5. Arrangement for rescue and casualty care. 6. Arrangement for burial control room. 7. Restoration of essential services, security and protection of property. 8. Coordination of assistance. 9. Damage and need assessment. 10. Immediate management of relief supplies. 11. Release excess water from height of T. 12. Lower the water level in culture facilities. 	<ol style="list-style-type: none"> 1). Planning even after the event should be made for proper drainage and creating awareness and trainings in flood situations. 2). Pinning even after the event should be made for proper drainage & creating awareness & training in flood situation. 3) Support to rehabilitation, logistics, training and awareness build up & testing and updating the plan 4) Reallocate fish to maintain appropriate biomass so that waste assimilation capacity of pond is not exceeded. 5) Reduce or cease feeding because uneaten food and fish waste decreases the dissolved oxygen level. 6) Strengthening of water bodies/ponds. 7) Loss assessment & insurance claim.
(ii) Water contamination and changes in water	<ol style="list-style-type: none"> 1. Availability of water purifier i.e., chlorine, alum etc at district level. 2. Availability of water disinfectant such as chlorine, alum etc at district level. 	<ol style="list-style-type: none"> 1. Supply of water purifier for the ponds to overcome the contamination and changes in BOD. 	<ol style="list-style-type: none"> 1. Supply of water purifier even after the event and creating awareness in farmers. 2. Supply of water filtration system even after

quality	<p>3. Use of calcium hydroxide @ 150 kg/ha</p> <p>4. Store chemicals, disinfectants and therapeutic drugs</p> <p>Develop flood control management plan</p>	<p>2. Supply of water filtration system for ponds to overcome the contamination.</p> <p>Use of KMno₄ for bath of fish as prophylactics</p> <p>3. Do not use contaminated water.</p> <p>4. Proper preparation and management through emergency aeration (paddle wheel aerator/circulating aerator), that may improve water quality in affected areas.</p> <p>5. Use appropriate amount of disinfectants, chemicals and therapeutic drugs.</p> <p>6. Maintaining the purity and quality of water bodies.</p> <p>7. Need based bioremediation.</p>	<p>the event & crating awareness in farmers.</p> <p>3. Lime treatment for oxidation</p> <p>4. To maintain water quality, need based research data should be generated</p> <p>5. Dumping of solid, liquid and waste should be stopped through enactment of legislation.</p> <p>6. Immediate remedy and cleaning of water bodies.</p> <p>7. Regular water monitoring and bio-monitoring of water bodies for formulation of management plan.</p>
(iii) Health and diseases	<p>1. Storage of water purifiers and control measures for diseases should be available.</p> <p>2. Personnel should be trained for health & disease management through training & list of trained personnel should be available at each district level.</p> <p>4. Adequate stock of medicine should be available at each district level.</p> <p>5. Antibiotics fortified feeding as prophylactics</p> <p>6. Advance planning and preparedness.</p> <p>7. Store chemicals, disinfectants and</p>	<p>1. Periodical checking particularly with respective fish mortality should be done during flood.</p> <p>2. Services of trained personnel need to be made available in affected areas with sufficient supply of life saving medicines.</p> <p>3. Disinfectants formalin treatments as prophylactics</p> <p>4. Identification of type of disease outbreak, immediate removal of</p>	<p>1. Setting health and disease management training centre at district level for fishermen and government officials.</p> <p>2. Routine training programmed as a refresher course need to be implemented in relation to health & disease management during flood.</p> <p>3 .Lime treatment for oxidation</p>

	<p>therapeutic drugs.</p> <p>8. Stock sufficient emergency medicines.</p>	<p>disease causing agents/ dead fish.</p> <p>5. Use appropriate amount of disinfectants, chemicals and therapeutic drugs.</p> <p>6. Determination of nature and speed of transmission of diseases.</p> <p>7. Emergency aeration or splashing in water bodies</p>	<p>4. Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread.</p> <p>5. Eradicating the disease.</p> <p>6. Follow up surveillance and monitoring.</p> <p>7. Proper disposal of dead fish.</p> <p>8. Loss assessment & insurance claim</p>
(iv) Loss of stock and inputs (feed, chemicals etc)	<p>1. Harvestable sized fishes shall be marketed before the event to avoid losses. The inputs like feed and chemical etc. shall be stored at safe places.</p> <p>2. Flood situation going to exist then move the feed, chemicals & other accessories to safer places.</p> <p>3. Keep the stock/input at safe place for emergency purpose.</p> <p>4. Store fuels, food/other item.</p> <p>5 .Develop flood control management plan.</p> <p>6. Stock material insurance.</p>	<p>1. The pond embankments will be fenced with netting to avoid fish losses. The store rooms for inputs like feed, chemicals etc. shall be created.</p> <p>2. Available fish stock should be recovered. Stock of inputs must be stored in well protected area.</p> <p>3. Search/locate the stock/input.</p> <p>4. Purchase/hire valuable stock/inputs from distant areas not affected by flood.</p>	<p>1. The fish farmers shall be provided with fish seed and feed at concessional rates.</p> <p>2. Feeds, chemicals etc required for the culture operation should be purchased.</p> <p>3. Strengthening of stocks.</p> <p>4. Assessment of total loss.</p> <p>5. Insurance claims</p>
(v) Infrastructure damage (pumps, aerators, huts etc)	<p>1. Prior information regarding removal of Pumps and aerators shall be given to the fish farmers.</p>	<p>1. Pumps, aerator and generators shall be removed from the pond before the event.</p>	

	<ol style="list-style-type: none"> 2. Flood situation going to exist then move the pumps, aerators & other accessories to safer places. 3. Educate and provide training for the repair of infrastructure. 4. Follow flood control management plan. 5. Store raw materials for repairing of pumps aerators, huts etc. 6. Infrastructure insurance. 	<ol style="list-style-type: none"> 2. Use manual techniques for aeration or make substitute arrangement for the same. 3. Notify utilities of the critical demand. 4. Coordination of assistance. 5. Immediate management of relief supplies. 	
3. Cyclone / Tsunami			
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	<ol style="list-style-type: none"> 1. If intensity of cyclone with heavy rain fall exists then harvest existing fish stock. 2. Dike should be stable in all weather condition & not liable to collapse during flood. 	<ol style="list-style-type: none"> 1. On the basis of forecasting information to farmers for sale of marketable fish with sufficient transport facility through various media. Proper drainage should be adopted so that inundation with storm water should be managed 2. Enhancement of dykes height by sand bags 	<ol style="list-style-type: none"> 2.

(ii) Changes in water quality (fresh water / brackish water ratio)	<ol style="list-style-type: none"> 1. Supply of water for correcting the changes in fresh water & brackish water. 2. Maintain salinity by addition of fresh water up to 20-25 ppt. 	<ol style="list-style-type: none"> 1. Supply of water for correcting the changes in fresh water & brackish water. 2. Use euryhaline species 	<ol style="list-style-type: none"> 1. Water storage facility needs to be developed to overcome the problem of changes in fresh & brackish water ratio. 2. use Euryhaline species for culture
(iii) Health and diseases	<ol style="list-style-type: none"> 1. Water filtration system & control measures for disease should be available. 2. Adequate stock of medicine should be available at each district level. 3. Liming and formalin treatment 	<ol style="list-style-type: none"> 1. Periodically checking particularly in respective of fish mortality & water parameter during flood. 2. Disinfectants treatments 	<ol style="list-style-type: none"> 1. Settling health & disease management training centre at district level for fishermen & Govt. official.
(iv) Loss of stock and inputs (feed, chemicals etc)	<ol style="list-style-type: none"> 1. Cyclone with heavy rain fall situation going to exist then move the feed, chemicals & other accessories to safer places. 2. Stock cover under insurance 	<ol style="list-style-type: none"> 1. Available fish stock should be recovered. 	<ol style="list-style-type: none"> 1. Feeds, chemicals etc required for the culture operation should be purchased. 2. Seed and feed to be supplied through Deptt of fisheries,
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)	<ol style="list-style-type: none"> 1) Cyclone with heavy rain fall situation going to exist then shifted the pumps, aerators & other accessories to safer places. 	<ol style="list-style-type: none"> 1) Use manual techniques for aeration or make substitute arrangement for the same. 	Compensation on assessment of actual losses & damage of pumps, aerators, shelters/huts given through RKVY, NCDC, NREGSui
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. Aquaculture			

(i) Changes in pond environment (water quality)	<ol style="list-style-type: none"> 1) If intensity of heat wave high, add water from other source. 2) Harvest existing fish stock. 3) Adequate facility should be ready for heat wave & system for changing water temperature during cold wave. 4) Listen to local weather forecasts and stay aware of upcoming temperature changes. 5) Arrange the aerators. 6) Ensure sufficient water quantity in water bodies. 7) Formulate strategic fishing management for the heat /cold waves. 8) Tree plantation around fish ponds 	<ol style="list-style-type: none"> 1) Adequate facility should be ready for heat wave & system for changing water temperature during cold wave. 2) Monitor fishing sites frequently to ensure that they are not affected by heat or cold waves. 3) Use dark materials to cover the water bodies during excessive heat waves. 4) Stay hydrated by drinking plenty of fluids during fishing/field work. 5) Adopt proper care and management during the fishing period of cold/heat wave like keeping stock of drinking water and extra cloths. 6) Educating the farmers through electronic or print media 7) Maintain Water level in pond 	<ol style="list-style-type: none"> 1) Adequate facility should be ready for heat wave & system for changing water temperature during cold wave. 2) Intensive afforestation program for reducing heat waves. 3) Collect basic weather data and incidence of extreme and physical data of water bodies, water chemistry and seasonal changes, plankton profile and seasonal blooms, topography and soil composition. 4) Gather information about history of catch per unit effort as well as fish yield rate during heat wave and cold wave and accordingly simulate future plan for sustainable fishing. 5) Loss assessment & insurance claim.
(ii) Health and Disease management	<ol style="list-style-type: none"> 1) Adequate stock of medicine should be available at each district level. 2) Advance planning and preparedness. 3) Store chemicals, disinfectants and therapeutic drugs. 4) Develop heat/ cold wave control management plan. 5) Stock sufficient emergency medicines. 	<ol style="list-style-type: none"> 1) Periodical checking particularly with respective fish mortality should be done. 2) Identification of type of disease outbreak, immediate removal of disease causing agents/ dead fish. 3) Use appropriate amount of disinfectants, chemicals and therapeutic drugs. 4) Determination of nature and speed of transmission of diseases. 5) Emergency aeration or splashing in water bodies 6) Bleaching powder 1 to 2 % , formalin treatment to prevent disease 	<ol style="list-style-type: none"> 1) Setting health & disease management training centre at district level for fishermen & Govt. official. 2) Laboratory diagnosis of diseased fish, generation of data about type or kind of disease spread. 3) Eradicating the disease. 4) Follow up surveillance and monitoring. 5) Proper disposal of dead fish. 6) Loss assessment & insurance claim. 7) KMNO₄ 2 % to maintain oxygen level