State: Manipur

Agriculture Contingency Plan for District: Thoubal

1.0 District Agriculture profile*				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	North-Eastern Hills (Purvachal), Warm Perhumid Eco-sub region (17.2)		
	Agro-Climatic Zone (Planning Commission)	Eastern Himalayan Region (II)		
	Agro Climatic Zone (NARP)	Sub-Tropical Zone (NEH-4)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Imphal West, Imphal East, Chandel, Churachandpur, Thoubal, Bishnupur, Senapati, Ukhrul, Tamenglong		
	Geographic coordinates of district headquarters headquarters	Latitude	Longitude	Altitude
		23 o25' N & 24o45'N	93o45E & 94o15'E	781 m
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	-		
	Mention the KVK located in the district with full address	KVK Thoubal,Wangbal		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Rice Research Station,Wangbal		

Source: Comprehensive District Agriculture Plan(Thoubal) 2007-12

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):	505.2	61.6	1st week of June	4th week of September
	NE Monsoon(Oct-Dec):	103.8	14	1st week of October	1st week of December
	Winter (Jan- February)	37.28	4	4th week of January	2nd week of February
	Summer (March-May)	239.82	29.3	1st week of March	4th week of May
	Annual	905.3	108.9	-	-

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)	51.4	22.9	0.56	2.11	0.31	0.18	2.64	0.49	-	-

1. 4	**Major Soils (common names like red sandy loam deep soils (etc.,)***	**Area ('000 ha)****	**Percent (%) of total geographical area**
	Deep red clay loam	3.5	1.7
	Clay loam to clay (less)	18.9	36.8
	Peat /muck/clay	16.7	32.6
	Silty clay	8.3	16.3
	Silty loam	1.5	3.0

1.5	**Agricultural land use**	**Area ('000 ha)**	**Cropping intensity %**
	Net sown area	33.21	149.6
	Area sown more than once	4.09	
	Gross cropped area	37.30	

1.6	**Irrigation**	Area ('000 ha)		
	Net irrigated area	-		
	Gross irrigated area	-		
	Rainfed area	18.1		
	Sources of Irrigation	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals			
	Tanks			
	Open wells			
	Bore wells			
	Lift irrigation schemes	33	7.37	
	Micro-irrigation			
	Other sources (please specify)			
	Total Irrigated Area			

	Pump sets	1349		
	No. of Tractors	350		
	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%				

1.7 Area under major field crops & horticulture

1.7	**Major field crops cultivated**	**Area ('000 ha)**							
		Kharif			***Rabi***				
		Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
	i)Pre-kharif rice ii)Kharif	6.61	21.6	28.26					28.26
	Maize i) kharif ii)Pre-kharif	0.12	0.45	0.57					0.57
	Pulses		0.6			3.0			3.6
	Oilseeds		0.5			3.5			4.0
	Sugarcane		0.8			1.2			2.0

	Horticulture crops - Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Pineapple	2.357	-	2.35
	Banana	0.450	-	0.45
	Lime/Lemon	0.110	-	0.11
	Orange	0.072	-	0.07
	Passion fruit	0.075	-	0.07
	Mango,guava,amla,grapefruit,other local plum etc	1.380	-	1.38
	Horticulture crops - Vegetables	**Total**	**Irrigated**	**Rainfed**
	Cauliflower	0.44	-	0.44
	Cabbage	0.66	-	0.66
	Tomato	0.36	-	0.36
	Pea	0.49	-	0.49
	Potato	0.15	-	0.15
	Brinjal,broccoli,raddish,knolkhol, pumpkin,carrot	0.79	-	0.79
	Medicinal and Aromatic crops	-	-	-
	Plantation crops	-	-	-
	Fodder crops	-	-	-
	Total fodder crop area	-	-	-
	Grazing land, reserve areas etc	-	-	-

	Availability of unconventional feeds/by products eg., breweries waste, food processing, fermented feeds bamboo shoots, fish etc	-	-	-
	Sericulture etc Other agro enterprises (mushroom cultivation etc specify)	-	-	-
	Others (specify)	-	-	-

1.8	**Livestock**	**Male ('000)**	**Female ('000)**	**Total ('000)**
	Indigenous cattle	40.14	83.95	124.09
	Improved / Crossbred cattle	5.65	13.71	19.37
	Buffaloes (local low yielding)	2.83	6.07	8.91
	Improved Buffaloes	-	-	-
	Goat	0.96	1.57	2.54
	Sheep	0.07	0.24	0.31
	Pig	34.23	22.60	56.84
	Mithun	-	-	-
	Yak	-	-	-
	Others (Horse, mule, donkey etc., specify)	0.1	0.09	0.19
	Commercial dairy farms (Number)			
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**	
	Commercial	1200	240.0	
	Backyard	25,505	153.03	

1.10 **Fisheries** (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

	ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**		**No. of Reservoirs**		**No. of village tanks**	
		1300					
	B. Culture						
				Water Spread Area (ha)		**Yield (t/ha)**	**Production ('000 tons)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)						
	ii) **Fresh water** (Data Source: Fisheries Department)			1016		1000 kg/ha	7400 (2008-09)
	Others						

1.11 Production and Productivity of major crops

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)										
	Rice	98.4	4358.2					98.4	4358.2	
	Maize	0.89	2158.3	0.09	1150			0.98		
	Wheat			0.062	2173.4			0.062	2173.4	
	Pulses	0.359	1100.21	2.216	794.28			2.575		
	Oilseeds	0.26	923.93	2.436	698.45			2.704		
	Sugarcane	28.6	57600	-	-	-	-	28.68	57600	
Major Horticultural crops (Crops to be identified based on total acreage)										
	Pineapple	35.2	15430.2					35.26		
	Banana	2.38	12143.5					2.387		
	Cauliflower			2.41	13451.5			2.412		
	Cabbage			3.80	7019.75			3.803		
	Tomato	1.58	4767.7					1.588		
	Potato			29.8	17074.25			29.87		

1.12	**Sowing window for 5 major field crops** (start and end of normal sowing period)	**Rice**	**Maize**	**Pulses**	**Oilseeds**	**Potato**
	Kharif- Rainfed	May-June - Late July	March-April to June	May-June to Late July	May-June- Late July	
	Kharif-Irrigated	June-July – Late July	June-July	May-June	June-July	
	Rabi- Rainfed			October-December	October-December	
	Rabi-Irrigated					
	Summer-irrigated					
	Summer-rainfed					February-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			√
	Snowfall			
	Landslides			
	Earthquake		√	
	Pests and disease outbreak (specify) **Rice-** leaf folder,stem borer,gundhi bug,false smut,blast, stem rot,sheath blight, Brown spot,stack burn	√	√	
	Chilly –Dieback, Fusarium & Verticiluin wilt, fruit borer	√	√	
	Potato-Early & late blight ,potato tuber moth Scurf,wire worm	√	√	
	Pulses-Powdery mildew & Rust pod borer Red hairy caterpillar	√	√	

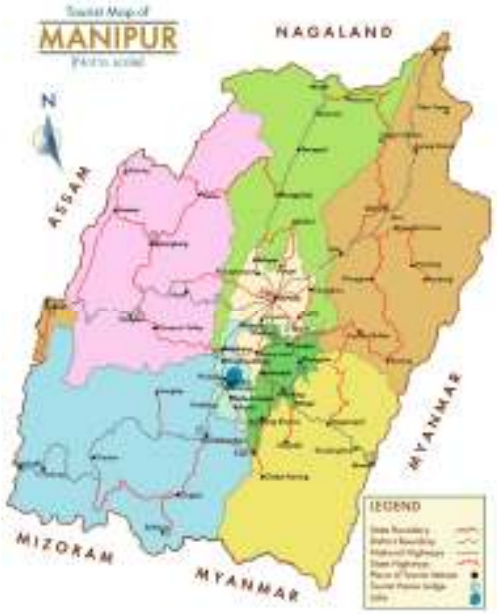
	Others (like fog, cloud bursting etc.)			

*When contingency occurs in six out of 10 years

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

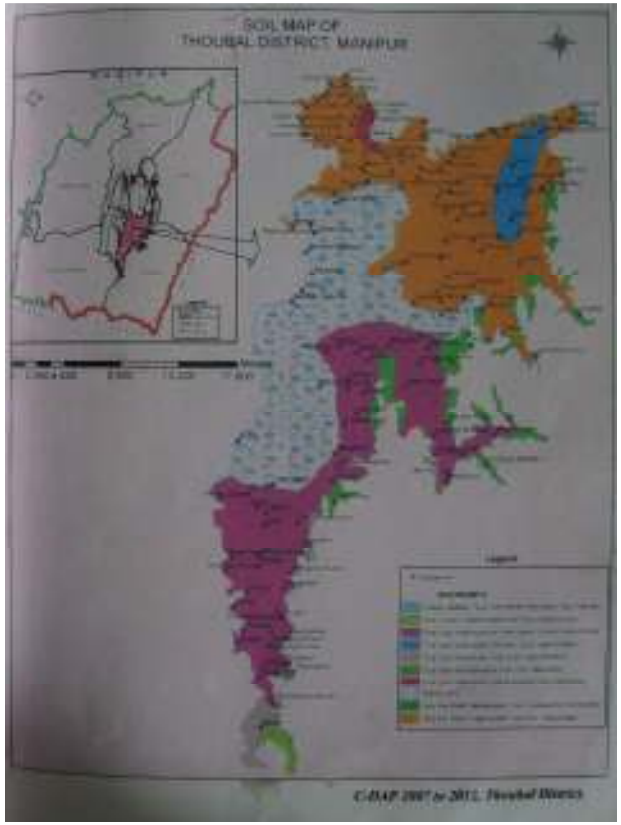
Annexure 1

Location map of Thoubal District



Annexure-III

Soil Map of Thoubal



2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Pre-monsoon

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**
	Marshy or shallow lake areas- Delay of monsoon better for these areas	Pre-kharif Rice- fish farming	No change	Normal transplanting	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks **(June 3rd week)**	Low land rainfed silty clay loam soils	Paddy-Mustard/ Paddy-pea/ Paddy-potato	Rice variety-leimaphou,Lungnila,RC-maniphou 6, followed by –Rape M-27 or Potato var. Kufri Jyoti or Rachana	Normal transplanting No change required as these varieties of paddy can cop up well.	-
	Foot hills with gentle slope with clay loam soils (Rainfed)	Soybean	Soybean: variety –JS-335	-	
		Groundnut	Groundnut: ICGS-76	-	
		Blackgram	Blackgram: T-9	-	
	Low land (Irrigated)	Paddy-pea / mustard / potato	Rice var Tampha, RCManiphou7, Sanaphou in normal time ie. June first week		

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 4 weeks **(July 1st week)**	Lowland silty clay loam soils (rainfed)	Paddy-mustard or rape/ Paddy-Pea/ Paddy-potato/ Paddy-vegetables	Rice variety –Pariphou,PAC 807(F1),Leimaphou,Lungnila,Tamphaphou followed by Kufri Jyoti	Rice to be transplanted density 10x10 cm & 3-4 seedlings/hill	
	Medium land – silty clay to clay loam soils (Rainfed)	Rice- vegetables	French bean or cabbage or broccoli or bottle gourd, or pumpkin or bitter gourd. Transplanting with short duration varieties (Pari,807) broadcasting of leima, Tampha,Lungnila.	-	
	Foot hills with gentle slope with clay loam soils (Rainfed)	Pulses,oilseeds	-	-	

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 3rd week	Lowland silty clay loam soils (rainfed)	Paddy-oilseed	Rice-Pari,Norin 18,Moirangphou(local) followed by pulses-Arkel,Azad,lentil,gram	Broadcasting sprouted seedlings of rice	
		Paddy-pulses	Maize-Pusa early hybrid maize	-	
		Paddy-vegetables	French bean or cabbage or broccoli or bottle gourd, or pumpkin or bitter gourd.	-	
	Foot hills with gentle slope with clay loam soils (Rainfed)	Blackgram	Blackgraml: T-9	Adopt line sowing	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks (August 1st week)	Not applicable				

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Lowland silty clay loam soils (rainfed)	Rice-pea-Rice Rice-Mustard Rice-Potato-Cucurbits Rice-Vegetables	Maintain dry nursery to use for gap filling		
	Foot hills with gentle slope with clay loam soils (Rainfed)	Oilseeds & pulses	Gap filling	Mulching	

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 measues**	**Remarks on Implementation**
At vegetative stage	Lowland silty clay loam soils (rainfed)	Rice-pea Rice-oilseed Rice-Potato-cucurbits Rice-vegetable	Vegetables	Repairing of bunds to check leakage Mulching	

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	Lowland silty clay loam soils (rainfed)	Rice-Pea Rice-Mustard Rice-Potato-Pumpkin	Application of anti-transpirant like kaoline (2%) Foliar application of MOP 1.5%		

Condition			Suggested Contingency measures		
Terminal drought	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Lowland silty clay loam soils (rainfed)	Rice-Pea Rice-Mustard Rice-Potato-Pumpkin	Harvest at physiological maturity	Early planting of rabi crops.	Seed from reliable sources through RKVY,ATMA

2.1.2 Drought - Irrigated situation- Not applicable

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Not Applicable				
Limited release of water in canals due to low rainfall					
Non release of water in canals under delayed onset of monsoon in catchment					

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon					
Insufficiency of surface water for irrigation					
Insufficient groundwater recharge due to low rainfall	Not applicable				

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

Condition	**Suggested contingency measure**			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**
Rice	Drain out if possible	-	Drain out if possible	Collect harvested materials and shift to safe areas, dry properly
Horticulture				
Potato	Drain out water apply little dots of plant boosters to recover from physiological injury	Drain out water	Harvest the crop in advance	
Cucurbits	Wait for another planting	No measures	No measures except harvesting crop	-
Heavy rainfall with high speed winds in a short span	Not applicable			
Horticulture	-			
Outbreak of pests and diseases due to unseasonal rains				
Rice	-	Apply Tricyclazole @ 10ml/15	Apply Dithane M-45 to	Dry grain sufficiently

		litres of water for blast	control false smut of rice Drain out water 10 days before harvesting Application of imidaclopid 17.8SL @ 7ml/15lit of water to control Gundhi bug	and safe storage
Maize			Harvest cobs for seeds before rains.	

2.3 Floods- Not applicable

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Continuous submergence for more than 2 days	Not applicable			
Sea water intrusion				

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

Extreme event type	**Suggested contingency measure**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave	-			
Cold wave				
Frost				
Hailstorm				
Cyclone				
Sand deposition or heavy siltation				

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	Insure livestocks,encourage of growing of fodder trees Silage making & prepare feed blocks	Use unconventional feeds such as Sugarcane leaf,bamboo leaf,azolla	Avail crop insurance make feed available
Drinking water	Sanitize community land and use water from sources After sanitization	Feed silage with concentrate	
Health and disease management	Procure vaccines & medicines	Conduct animal health camps	
Floods			
Feed and fodder availability	Insure livestocks,encourage growing of fodder trees in upland areas	Use procured feeds & fodders	Provide supplementary feeding with feed supplement
Drinking water	Sanitize community water tanks	Use sanitize water from the community tank or other waves	Provide clean & safe drinking water
Health and disease management	Vaccinate livestocks	Vaccinate livestocks	Arrange animal health camps to control disease like FMD,B.Q,Anthrax etc). Disinfect animal shed.
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			

2.5.2 Poultry

	Suggested contingency measures			Convergence/linkages with ongoing programs, if any
	Before the event	**During the event**	**After the event**	
Drought				
Shortage of feed ingredients	Procurement of feed ingredients in advance	Restricted feeding utilize feed from reserved source,feed judiciously.	Make available the feed ingredients	
Drinking water	Use chlorinated water	Use chlorinated water	Make available water	
Health and disease management	Procure vaccines ,medicines & antistress agents.Feed antibiotics.	Administered vaccines & feed antistress agent	Killed the affected birds	
Floods				
Shortage of feed ingredients	Procured feed in advance	Restrict feeding	Make available the feeds	
Drinking water	Protect water source from submergence	Use chlorinated water	Sanitize water source with bleaching powder	
Health and disease management	Procure vaccines & medicines	Feed antibiotics,Replace wet litter	Disinfect the farm premises.Feed antibiotics & do deworming.	
Cyclone				
Shortage of feed ingredients				
Drinking water				
Health and disease management				
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				

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			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow	Use water judiciously from the reservoir.Renovate & maintain existing ponds	Restrict use of water for other purposes	Release water into the pond.Increase depth of pond.
(ii) Impact of salt load build up in ponds / change in water quality	Prepare to release water into the pond	Reduce density of population in the pond	Monitoring the water quality and health of aquatic organisms.
(iii) Any other			
2) Floods			
A. Capture			
Marine			
Inland			
(i) Loss of stock			
(ii) Changes in water quality			
(iii) Health and diseases			
B. Aquaculture			

(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			

B. Aquaculture			
(i) Changes in pond environment (water quality)	Take appropriate measures to check seepage into pond e.g. Raising bunds to prevent entry of water	Check the water quality & take appropriate action	1. Application of lime and geolite. 2. Application of Alum. 3. Application of KmnO4
(ii) Health and Disease management	Stock preventive medicines, vaccines	Prevent influx of diseased fish from outside source, Check through nets Administer medicines through random catch Disinfect water by lime , KMnO4	1. Application of lime and KmnO4. 2. Assessment of the health status of fish and accordingly control measure should be taken. 3. Control on transport of brooders and seeds.
(iii) Any other			

[a] based on forewarning wherever available