

**State: GUJARAT**  
**Agriculture Contingency Plan for District: TAPI**

1.0 District Agriculture profile					
<b>1.1</b>	<b>Agro-Climatic/Ecological Zone</b>				
	Agro Ecological Sub Region (ICAR)	Central (Malva ) Highlands, Gujarat Plains and Kathiawar, Peninsula Ecoregion (5.2)			
	Agro-Climatic Zone (Planning Commission)	Gujarat plains and hills region (XIII)			
	Agro Climatic Zone (NARP)	South Gujarat Heavy Rainfall Zone (GJ-1), South Gujarat zone (GJ-2)			
	List all the districts or part thereof falling under the NARP Zone	Navsari, Valsad, Dangs Tapi			
	Geographic coordinates of district headquarters	Latitude	Longitude	Altitude	
		21° 11' 31.56 " N	72° 48' 18.15"E	10.66 m	
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Regional Rice Research Station, Vyara-394 650, Dist-Tapi Navsari Agricultural University, Navsari			
	Mention the KVK located in the district	Krishi Vigyan Kendra, NAU., Vyara-394 650, Dist-Tapi			
<b>1.2</b>	<b>Rainfall</b>	Normal RF(mm)	Normal Rainy days (number)	Normal Onset ( specify week and month)	Normal Cessation (specify week and month)
	SW monsoon (June-Sep):	1536	58	3 <sup>rd</sup> week of June	4 <sup>th</sup> week of September
	NE Monsoon(Oct-Dec):	-----		-	-
	Winter (Jan- March)	-----		-	-

	Summer (Apr-May)	-----		-	-
	Annual	1536	58	-	-

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)	345.0	164.1	74.0	48.5	8.9	3.4	--	45.6	0.5	---

(Source :District Panchayat reports, reports of Agriculture department)

1.4	Major Soils (common names like red sandy loam deep soils (etc.))*	Area ('000 ha)	Percent (%) of total
	Plain Area- Heavy black soils	150.7	43.7
	Hilly Area- Light soil (lateritic and eroded shallow and Clay loam moderately deep shallow soil	89.7	26.0

1.5	Agricultural land use	Area ('000 ha)	Cropping intensity %
	Net sown area	164.1	170.2 %
	Area sown more than once	115.2	
	Gross cropped area	279.3	

1.6	<b>Irrigation</b>	Area ('000 ha)		
	Net irrigated area	63.4		
	Gross irrigated area	72.5		
	Rain fed area	100.7		
	<b>Sources of Irrigation</b>	Number	Area ('000 ha)	Percentage of total irrigated area
	Canals	3	72.2	35
	Tanks	-	-	--
	Open wells	15654	-	25
	Bore wells	24562	-	30
	Lift irrigation schemes	46	-	5
	Micro-irrigation	1256	-	5
	Other sources (please specify)	-	-	-
	Total Irrigated Area	-	72.2	100.0
	Pump sets	14546	-	-
	No. of Tractors	8746	-	-
	<b>Groundwater availability and use* (Data source: State/Central Ground water Department /Board)</b>	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	Yes	-	-	
Wastewater availability and use	-	-	-	
Ground water quality				

( Source :District Panchayat reports, reports of Agriculture department)

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

1.7	Major field crops cultivated	Area ('000 ha)							
		<i>Kharif</i>			<i>Rabi</i>			Summer	Grand total
		Irrigated	Rain fed	Total	Irrigated	Rain fed	Total		
Paddy	61.7	32.5					0.7	94	
Sorghum		37.6						37.6	
Sugarcane				110				110	
Groundnut	8.1						19.0	27.6	
Cotton	23.5							23.5	

	Horticultural crops - Fruits	Area ('000 ha)		
		Total	Irrigated	Rain fed
	Mango	8.5	8.5	
	Sapota	1.9	1.9	
	Banana	11.7	11.7	
	Papaya	1.4	1.4	
	Custard apple	0.0		0.050
	Horticultural crops - Vegetables		Total	
	Okra	7.5		
	Brinjal	7.0		
	Onion	0.0		
	Chili	2.5		
	Tomato	1.7		
		9.1		
	<b>Medicinal and Aromatic crops</b>		Total	
	<b>Plantation crops</b>		Total	
	<b>Fodder crops</b>		Total	
	<b>Total fodder crop area</b>			
	<b>Grazing land</b>			

	<b>Sericulture etc</b>	
	<b>Others (specify)</b>	

<b>1.8</b>	<b>Livestock</b>	<b>Male ('000)</b>	<b>Female ('000)</b>	<b>Total ('000)</b>				
	Non descriptive Cattle (local low yielding)	12.1	155.6					
	Crossbred cattle	2.1	58.9	151.6				
	Non descriptive Buffaloes (local low yielding)	-	176.4	176.4				
	Graded Buffaloes							
	Goat	-	-	93.2				
	Sheep	-	-	0.5				
	Others (Camel, Pig, Yak etc.)	-	-	-				
	Commercial dairy farms (Number)	-	-	-				
<b>1.9</b>	<b>Poultry</b>	<b>No. of farms</b>	<b>Total No. of birds ('000)</b>					
	Commercial	45	555.7					
	Backyard	21	222.2					
<b>1.10</b>	<b>Fisheries (Data source: Chief Planning Officer)</b>							
	<b>A. Capture</b>							
	<b>i) Marine (Data Source: Fisheries Department)</b>	<b>No. of fishermen</b>	<b>Boats</b>		<b>Nets</b>		<b>Storage facilities (Ice plants etc.)</b>	
			Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)		
	<b>ii) Inland</b>	<b>No. Farmer owned ponds</b>		<b>No. of Reservoirs</b>		<b>No. of village tanks</b>		
		---		----		-----		
	<b>B. Culture</b>				<b>Not applicable</b>			
		<b>Water Spread Area (ha)</b>		<b>Yield (t/ha)</b>		<b>Production ('000 tons)</b>		
	<b>i) Brackish water (Data Source: MPEDA/ Fisheries Department)</b>	--		--		--		
	<b>ii) Fresh water (Data Source: Fisheries Department)</b>	--		--		--		
	<b>Others</b>	--		--		--		

(Source :District Panchayat reports, reports of Agriculture department)

### 1.11 Production and Productivity of major crops (Average of last 5 years)

1.11	Name of crop	Kharif		Rabi		Summer		Total		Crop residue as fodder ('000 tons)
		Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	Production ('000 t)	Productivity (kg/ha)	
<b>Major Field crops (Crops to be identified based on total acreage)</b>										
mt										
	Paddy	105.80	2159			14.48	2587	120.28	4746	
	Sorghum	50.1	1331					50.1	1331	
	Sugarcane			201.500	7700			7700	70000	
	Groundnut					35.67	1829	35.67	1829	
	Cotton	70.138	507					70.138	507(Lint)	

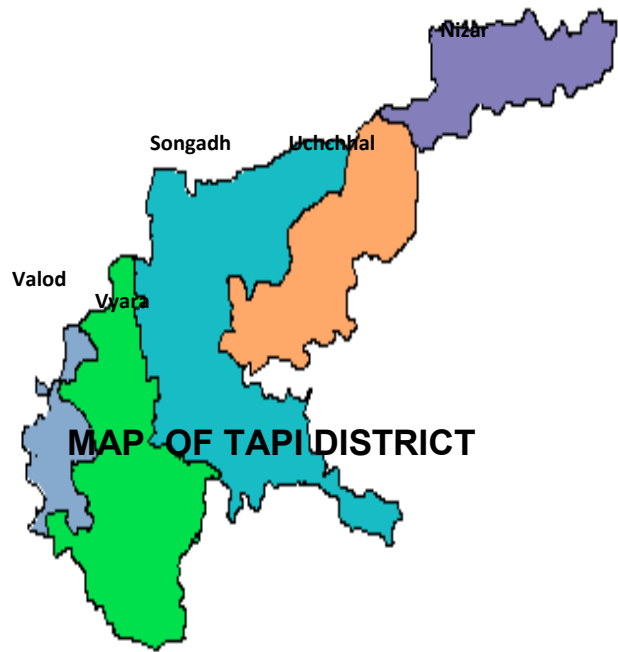
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
Others	Mango	-	-	-	-	70.1	8200	70.1	8200	-
	Sapota	-	-	-	-	19.9	10000	19.9	10000	-
	Banana	-	-	763.8	65000	-	-	763.8	65000	-
	Papaya	-	-	8.7	6000	-	-	8.7	6000	-
	Custard apple	-	-	-	-	0.075	1500	0.075	1500	-
<b>Major Horticultural crops (Crops to be identified based on total acreage)</b>										
	Okra	11	1453					11	1453	
	Brinjal	22	3120					22	3120	
	Onion			0.55	27210			0.55	27210	
	Chili	2.54	980					2.54	980	
	Tomato			8.5	5000			8.5	5000	

<b>1.12</b>	<b>Sowing window for 5 major field crops</b> (start and end of normal sowing period)	Paddy	Sorghum	Sugarcane	Groundnut	Cotton
	Kharif- Rain fed	1 <sup>st</sup> week of June- 4 <sup>th</sup> week September	1 <sup>st</sup> week of August- 4 <sup>th</sup> week September	-	-	-
	Kharif-Irrigated	1 <sup>st</sup> week of June- 4 <sup>th</sup> week September	1 <sup>st</sup> week of August - 4 <sup>th</sup> week October	-	-	-
	Rabi- Rain fed	-	-			
	Rabi-Irrigated	-	-	1 <sup>st</sup> week of October - 1 <sup>st</sup> week February	1 <sup>st</sup> week of December - 4 <sup>th</sup> week March	1 <sup>st</sup> week of June - 1 <sup>st</sup> week October

<b>1.13</b>	<b>What is the major contingency the district is prone to? (Tick mark)</b>	<b>Regular</b>	<b>Occasional</b>	<b>None</b>
	Drought			√
	Flood			√
	Cyclone			√
	Hail storm			√
	Heat wave			√
	Cold wave			√
	Frost			√
	Sea water intrusion			√
	Pests and disease outbreak (specify)		√	
Others (specify)				

( Source :District Panchayat reports, reports of Agriculture department)

<b>1.14</b>	<b>Include Digital maps of the district for</b>	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



Location map of district within State as Annexure I



## Annexure 2

### Regarding last 10 years rain fall :-

Since this district is newly formed *i.e.* in the year of 2007, these data are not available. Earlier this district was a part of Surat district

Sr.No.	Year	Rainfall(mm)
1	2007	1396.4
2	2008	1825.0
3	2009	1386.0

## 2.0 Strategies for weather related contingencies

### 2.1 Drought

#### 2.1.1 Rain fed 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 1 <sup>st</sup> week of July	Moderately deep black & sandy loam soil (Plain area)	Paddy	No Change	Intercultivation, Protect Irrigation and weed management	Linkage with RKVY, NSC and NFSM
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		

	Sandy loam soil (Hilly area)	Paddy	No Change		
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		

Condition			Suggested Contingency measures		
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 4 weeks 31 <sup>rd</sup> week of July	Moderately deep black & sandy loam soil (Plain area)	Paddy	No Change	Wider spacing Mulching Micro irrigation - Inter cultivation	Linkage with GSSC NSC RKVY NHM
		Sorghum	No Change		
		Sugarcane	No Change		
		Groundnut	No Change		
		Cotton	No Change		
	Sandy loam soil (Hilly area)	Paddy	No Change	20 % Higher seed rate	
		Sorghum	No Change	Higher fertilizer	
		Sugarcane	No Change	Moisture conservation	
		Groundnut	No Change	Salt tolerant varieties	
		Cotton	No Change		

Condition					
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delay by 6 weeks 1 <sup>st</sup> week of August	Moderately deep black & sandy loam soil (Plain area)	Situation does not arise			
	Sandy loam soil (Hilly area)				

Condition					
Early season drought (delayed onset)	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Situation does not arise					
Delay by 8 weeks 3 <sup>rd</sup> week of August		Situation does not arise			

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.	Moderately deep black & sandy loam soil (Plain area)	Paddy	Gap filling Thinning Give protective irrigation	Adopt foliar sprays of nutrients Avoid interculturing	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			

		Cotton			
	Sandy loam soil (Hilly area)	Paddy	-Do-	-Do-	
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
At vegetative stage	Moderately deep black & sandy loam soil (Plain area)	Paddy	Use antitranspirant chemical  Repeated intercultivation	Use plastic or grass mulch.  Application of foliar nutrients Give protective irrigation	Linkage with RKVY, NSC and NFSM
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Use plastic or grass mulch. Application of foliar nutrients. Give protective irrigation	As above	
		Sorghum			
		Sugarcane			
		Groundnut			
		Cotton			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Soil nutrient & moisture conservation measures	Remarks on Implementation
Mid season drought (long dry spell)					
At flowering/ fruiting stage	Moderately deep black & sandy loam soil (Plain area)	Paddy	Give protective irrigation	Adopt foliar application of nutrients at flowering stage	Linkage with RKVY, NSC and NFSM
		Sorghum	Weed management		
		Sugarcane			
		Groundnut			
		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Give protective irrigation	Adopt foliar application of nutrients at flowering stage	As above
		Sorghum	Weed management		
		Sugarcane			
		Groundnut			
		Cotton			

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Crop management	Rabi Crop planning	Remarks on Implementation
Terminal drought (Early withdrawal of monsoon)					
	Moderately deep black & sandy loam soil (Plain area)	Paddy	Harvest at physiological maturity stage	Adopt foliar application of nutrients	As above
		Sorghum	Give protective irrigation		
		Sugarcane			
		Groundnut			
		Cotton			
	Sandy loam soil (Hilly area)	Paddy	Harvest at physiological maturity stage	Adopt foliar application of nutrients	As above

		Sorghum	Give protective irrigation		
		Sugarcane			
		Groundnut			
		Cotton			

### 2.1.2 Drought - Irrigated situation:

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Delayed release of water in canals due to low rainfall	Moderately deep black & sandy loam soil (Plain area)		Not Applicable		
	Sandy loam soil (Hilly area)				

Condition	Major Farming situation	Normal Crop/cropping system	Suggested Contingency measures		
			Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Limited release of water in canals due to low rainfall	Moderately deep black & sandy loam soil (Plain area)		Not applicable		
	Sandy loam soil (Hilly area)				

Condition	This is not expected in this district				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Non release of water in canals under delayed onset of monsoon in catchment	Moderately deep black & sandy loam soil (Plain area)	Not applicable			
	Sandy loam soil (Hilly area)				

Condition	This is not expected in this district				
	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	Moderately deep black & sandy loam soil (Plain area)	Not applicable			
	Sandy loam soil (Hilly area)				

Condition	This is not expected in this district				
	Major Farming situation	Normal Crop/cropping system	Change in crop/cropping system	Agronomic measures	Remarks on Implementation
Insufficient groundwater recharge due to low rainfall	Moderately deep black & sandy loam soil (Plain area)	Not Applicable			
	Sandy loam soil (Hilly area)				

## 2.2 Unusual rains (untimely, unseasonal etc) (for both rain fed and irrigated situations)

Condition	Suggested contingency measure			
	Vegetative stage	Flowering stage	Crop maturity stage	Post harvest
<b>Continuous high rainfall in a short span leading to water logging</b>				
Paddy	Resowing Provide drainage	Use early maturity variety GR5	Plan for rabi crop	Shift to safer place
Sorghum	-Do-	-Do- GJ35	-Do-	-Do-
Sugarcane	-Do-	-Do- Co-N 5071	Do-	-Do-
Groundnut	-Do-	-Do-	Do-	-Do-
Cotton	-Do-	-Do-	Do-	-Do-
<b>Horticulture</b>				
Mango	-Do-	-	-	Shift to safe place dry in shade and turn frequently
Sapota	-Do-	-	-	-Do-
Banana	-Do-	-	-	-Do-
Papaya	-Do-	-	-	-Do-
Custard apple	-Do-	-	-	-Do-
<b>Heavy rainfall with high speed winds in a short span</b>				
Paddy	Resowing, Gap filling Provide drainage	Use early maturity variety	Plan for rabi crop	-Do-
<b>Horticulture</b>				
<b>Outbreak of pests and diseases due to unseasonal rains</b>	Give crop wise pest & disease management in detail			
Paddy	carbofuran@3%	carbofuran@3%	carbofuran@3%	carbofuran@3%
Sorghum	-Do-	-Do-	-Do-	-Do-
Sugarcane	-	-	-	-
Groundnut	-Do-	-Do-	-Do-	Do-
Cotton	-Do-	-Do-	-Do-	---
<b>Horticulture</b>				



Mango				
Sapota				
Banana				
Papaya				
Custard apple				

**2.3 Floods : Not Applicable**

Condition	Suggested contingency measure			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Transient water logging/ partial inundation				
Horticulture				
Continuous submergence for more than 2 days				
Horticulture				
Sea water intrusion				

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

Extreme event type	Suggested contingency measure <sup>r</sup>			
	Seedling / nursery stage	Vegetative stage	Reproductive stage	At harvest
Heat Wave				
Horticulture				
Cold wave				
Horticulture				
Frost				
Horticulture				

<b>Hailstorm</b>			
<b>Horticulture</b>			
<b>Cyclone</b>			
<b>Horticulture</b>			

## 2.5 Contingent strategies for Livestock, Poultry & Fisheries

### 2.5.1 Livestock

	<b>Suggested contingency measures</b>		
	<b>Before the event</b>	<b>During the event</b>	<b>After the event</b>
<b>Drought</b>			
Feed and fodder availability	If Paddy straw available	If feed is not available than tree leaves can be used for feed	tree leaves can be used for feed
Drinking water	If available	If available	If available
Health and disease management	Vaccination is necessary	--	--
<b>Floods</b>			
Feed and fodder availability	Tree leaf used as feed	Tree leaf	If Grass is available
Drinking water	Necessary	Necessary	Necessary
Health and disease management	Different B.Q., Leptospirosis vaccine required	Different B.Q., Leptospirosis vaccine required	Different B.Q., Leptospirosis vaccine required
<b>Cyclone</b>	Not observed		
Feed and fodder availability			
Drinking water			
Health and disease management			
<b>Heat wave and cold wave</b>	Not observed		
Shelter/environment management			
Health and disease management			

## 2.5.2 Poultry

	Suggested contingency measures			Convergence/link ages with ongoing programs, if any
	Before the event	During the event	After the event	
<b>Drought</b>				
Shortage of feed ingredients	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks, encouraging fodder crops in irrigated area Silage – using excess fodder for silage	- Utilizing fodder from perennial trees and Fodder bank reserves Utilizing fodder stored in silos Transporting excess fodder from adjoining districts Use of feed mixtures	--	Awareness programme for nutritious feed
Drinking water	If available from well, Bore well	If available from well, Bore well	If available from well, Bore well	--
Health and disease management	Disease resi. Vaccination required	Disease resi. Vaccination required	Disease resi. Vaccination required	Awareness programme for health and disease
<b>Floods</b>	Not observed			
Shortage of feed ingredients				
Drinking water				
Health and disease management				
<b>Cyclone</b>	Not observed			
Shortage of feed ingredients				
Drinking water				
Health and disease management				
<b>Heat wave and cold wave</b>	Not observed			
Shelter/environment				

management				
Health and disease management				

### 2.5.3 Fisheries/ Aquaculture: Not observed

	Suggested contingency measures		
	Before the event <sup>a</sup>	During the event	After the event
<b>1) Drought</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
<b>B. Aquaculture</b>			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			
<b>2) Floods</b>			
<b>A. Capture</b>			
Marine			
Inland			
(i) Average compensation paid due to loss of human life			
(ii) No. of boats / nets/damaged			
(iii) No.of houses damaged			
(iv) Loss of stock			
(v) Changes in water quality			
(vi) Health and diseases			
<b>B. Aquaculture</b>			
(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			
<b>3. Cyclone / Tsunami</b>			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			
B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
<b>4. Heat wave and cold wave</b>			
A. Capture			
Marine			
Inland			
B. Aquaculture			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			