RIVER FISH MONITORING

– Dr. K. K. Hemalatha

Submitted to

Kerala State Biodiversity Board

FISH MONITORING SURVEY OF

BHARATHAPUZHA UPPER CATCHMENT AREA, KERALA

TRIBUTARIES

I) CHITTURPUZHA
2) GAYATHRIPUZHA
3) KALPATHYPUZHA

DR. K K HEMALATHA
Reader and Head,
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Ottapalam-3

Submitted to

Kerala State Biodiversity Board, Thiruvananthapuram

Date: 30.07.2010.

Study Team

1 Team Leader: **Dr. K K Hemalatha**

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2 Members:

(i) **Dr. R Rajkumar,**
Reader,
PG and Research Dept. of Zoology,
Govt. Victoria College, Palakkad.

(ii) **Sri. Guruvayoorappan,**
Wild Life Cooradinator, South India Chapter.

(iii) **Sri. Sreejith,**
PG Student,
Govt. Victoria College, Palakkad.

3 Names of fishermen:

Sri M. Krishnan

Sri K. Krishnan

Study period and localities:

Pre-monsoon Survey conducted in **May 2010.**

Dates: **24.05.10, 25.05.10, 26.05 10 and 27.05.2010.**

Locations: **Chitturpuzha**-	Kunnamkattupathy	- Upper site
	- Puzhappalam	-Middle site
	- Parli	- Lower site
Gayathripuzha	- Seetharkundu	- Upper site
	- Oottara	- Middle site
	- Mayannur	- Lower site
Kalpathypuzha	–Kadukkamkunnupathy	- Upper site
	- Kalpathy	- Middle site
	- Parlippalam	- Lower site

Conducted survey in the three major tributaries of Bharathapuzha Upper Catchment area, for the pre-monsoon period, in the month of **May, 2010**. In **Chitturpuzha, Kalpathypuzha and Gayathripuzha,** the study sites are accessible by Jeep except Seetharkundu of Gayathripuzha which is the highest site, and is accessible only by four wheel drive jeep and then more than five kms walk. This was the deepest and the purest collection site. Full of rocks and Boulders and we could not see the river bed due to depth and the assessed depth is 30feet. We could collect fish from the comparatively valley region of the site.

Introduction

The **Bharathappuzha,** the second longest river in Kerala, is the lifeline of many cities and villages. For the first 40 km or so, the Bharathappuzha follows an almost northerly course till Pollachi. A little more than two-thirds of this area (4400 km²) is within Kerala and the remaining area (1786 km²) is in Tamil Nadu. Though Bharathapuzha has a large basin, the water flow is relatively less compared to other long rivers in Kerala because a large portion of the basin is located in the comparatively drier regions (Tamil Nadu and Palakkad Gap). The river is the Nile of Kerala and has the name Nila also. Its main tributaries are Chitturppuzha, Kalpathypuzha, Gayatahrippuzha and Thoothappuzha.

Chitturppuzha starts from Moolathara Dam where water reaches from many streams of Parambikulam and Aaliyar of Tamilnaad., Flows through Moolathara, para, Kambalathara, Mullanthode, Chittur, Kodumbu, Kannadi, Parli and joins to Bharathapuzha. Chitturpuzha or Kannadipuzha has Palar, Aliyar, Uppar as its tributaries. In Chittur this river is known as Sokanaasini and in Kannadi it is known as Kannadipuzha. It irrigates above 65kms in Palakkad.

The Kalpathipuzha originates in the upper slopes of the Western Ghats deep inside Palakkad district from the place called Chenthamarakulam in the hills, north of Walayar. It is formed from the confluence of four streams, namely Malampuzha, Walayar, Korayar and Varattar. The Malampuzha Dam is built across this river just before it enters into Palakkad town. The river is named after the **Kalpathi Siva temple** in Palakkad town and formed after the union of Korayar from Anamalai and Malampuzha at Kadukkamkunnu region.

Gayathripuzha is one of the main tributaries of the Bharathapuzha. It originates from Anaimalai hills, passes through Kollengode, Nenmara, Alathur, Wadakanchery and Pazhayannur before joining to Bharathapuzha at Mayannur. Gayathripuzha has Mangalam river,Ayalurpuzha,Vandazhippuzha,Meenkarappuzha, and Chulliyar as its tributaries.

One of the problems faced by Kalpathypuzha, like most of the other rivers in Kerala, is illegal sand mining. This has left many pits in the river bed which lead to shrub growth. During summer the river is covered by a green carpet of Water Hyacinth (Perari local name) and other shrubs. The is getting deeper by sand removal, there is saltwater intrusion even in the upper reaches construction of a number of dams after independence has also reduced the river flow. In fact in the summer months, there is almost no flow in most parts of the river, only with small ditches. The freshwater discharge from the river has been decreasing continuously. While the river of the river.

All the three tributaries of Bharathapuzha are facing the same problems related to the river structure, but the scenario is severe in Kalpathypuzha where the vegetation and sand mining are in its extreme level.

Methods:

As the depth was very low and the river bed was laden with pebbles, gravel, mud or silt collection was difficult in many of the cases. In addition to the nets supplied by the KSBB, cast net and mosquito nets were also used.

Collections were made from different regions along the river using gill net and cast net. At very shallow regions nylon mosquito net was also used. The main collections were done from the pools like regions of the river and also from occasional, pits of sand mining.

After counting, the fishes were released back to the river, after preserving a few samples for identification.

Water quality was analysed using the Water Quality Test Kit provided by the KSBB.

Scoping study was conducted on **20th May, 2010**.

Observations:

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: CHITTUR PUZHA, Tributary of Bharathapuzha	
Name of survey site: Kunnamkattupathy Lower/Middle/Upper ✓	District and Panchayath: Palakkad Dist., Perumatti panchayath, Chittur.
GPS Reading (Lat. and Long.) (Optional)	Name of Team Leader: Dr. K. K. HEMALATHA
Date: 24. 05. 2010	Time: 01. Pm

N.B. Put tick mark in appropriate options; Enter the respective option number in computer Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 39 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ but water will be seen throughout in certain ditches in the area Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Mountain ✓ (2) Laterite hill (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest (2) Grass land (3) Agriculture ✓ (4) Plantation ✓ (5) Tribal settlement ✓ (6) Human habitation ✓ (7) Township (8) Industrial area ✓ (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence (1) Some potential sources (2) Obvious sources ✓ Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs ✓ (4) Grasses ✓ (*) Others (Specify) Twiners (5) Forest plantations (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m): 200 m Stream width (m): 150 m Sampling reach area (m^2): 30000 m^2 Stream depth (m): Average 1.5 m, major regions with small pools Velocity: Slow/moderate m/min/sec. Canopy cover (%) 20% Stream Morphological Types Riffle ..—.. (%); Run ..50%.. (%); pools ..50%..(%) Channelized: (0) No (1) Yes ✓ Dam Present: (0) No (1) Yes ✓
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): ആമ്പൽ, ചെറാവി, തൊരത,
G. WATER QUALITY	Temperature (°C): 30°C Conductivity: Dissolved Oxygen: pH: 7.5 Chloride = 50 ppm Turbidity: clear Alkalinity = 240 " Nitrite: Hardness = 300 " Nitrate: Calcium = 200 " Phosphate: 0.5 ppm Magnesium = 100 " Sulphate: Within 200 ppm Iron = 0.3 ppm Water odours: (0) None ✓ (1) Sewage (2) Petroleum (3) Chemical (4) Fishy (5) Acid (6) Other ..... Water colour: (0) Colourless ✓ (1) Green (2) Brown (3)..... Turbidity (if not measured) (0) Clear ✓ (1) Slightly turbid (2) Turbid (3) Opaque (4) Stained (5) Other .....

H. BOTTOM MATERIALS a. Inorganic Materials (%)	Bedrock 20% Boulder Cobble Gravel 20% Sand 40% Silt 10% Clay 10% filled ditches (Should add up to 100%)
b. Organic Materials	(1) Detritus ✓ (2) Muck Mud ✓ (3) Marl ✓

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: GAYATHRI PUZHA, Tributary of Bharathapuzha	
Name of survey site: Lower/Middle/Upper "Upper reach Seethakkundu"	Districts and Panchayath: Palakkad District, Kollemcode Panchayath
GPS Reading (Lat. and Long. (Optional))	Name of Team Leader: Dr. K K. Hemalatha
Date: 25.05.2010	Time: 01.10 PM

N.B. Put tick mark to appropriate options; Enter the respective option number in computer Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 38 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Montane ✓ (2) Laterite hill (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest ✓ (2) Grass land (3) Agriculture ✓ (4) Plantation ✓ (5) Tribal settlement (6) Human habitation ✓ (7) Township (8) Industrial area (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence ✓ (1) Some potential sources (2) Obvious sources Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs ✓ (4) Grasses ✓ (*) Others (Specify) Ferns (5) Forest plantations ✓ (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m): 300(m) Stream width (m): 50 m Sampling reach area (m^2) 15000 m^2 Stream depth (m): About 10 m Velocity: Slow, moderate fst/mid/sec. Canopy cover (%) 10% Stream Morphological Types Riffle ... 10 ... (%): Run ... 20 ... (%); pools 70 ... (%) Channelized: (0) No (1) Yes ✓ Dam Present: (0) No ✓ (1) Yes
F. AQUATIC VEGETATION	Free floating hydrophytes: no Floating but rooted hydrophytes: no Rooted and submerged hydrophytes no Suspended hydrophytes no Wetland or marsh plants no Attached algae: Very slightly Others (Specify): ~~Dog~~ clear water
G. WATER QUALITY	Temperature (°C): 20°C Conductivity: Dissolved Oxygen: Permissible pH: 7 Chloride = 30 ppm 250 ppm Turbidity: clear Alkalinity = 50 ppm 250 " Nitrite: x Calcium = 70 ppm 300 " Nitrate: x Hardness = 80 ppm 200 " Phosphate: 0.5 ppm Magnesium = 10 ppm 140 " Iron = 0.3 ppm " Sulphate: Very much within the 200 ppm Water colours: (0) None ✓ (1) Sewage (2) Petroleum (3) Chemical (4) Fishy (5) Acid (6) Other ..... Water colour: (0) Colourless ✓ (1) Green (2) Brown (3) ..... Turbidity (if not measured) (0) Clear ✓ (1) Slightly turbid (2) Turbid (3) Opaque (4) Stained (5) Other .....

H. BOTTOM MATERIALS a. Inorganic Materials (%)	Bedrock	Could not reach the bottom Sides
	Boulder	one rocky 100%
	Cobble	Lower region with Boulder 40%
	Gravel	Cobble 40%
	Sand	Gravel 20%
	Silt	—
	Clay	—
	(Should add up to 100%)	—
b. Organic Materials	(1) Duff/litter (2) Muck/Mud (3) Mar	—

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: KALPATHY PUZHA, Tributary of BHARATHAPUZHA	
Name of survey site: KADUKKAMKUNNU – NILAMPATHY Lower/Middle/Upper ✓	District and Panchayath: Palakkad Dist, Palakkad municipality
GPS Reading (Lat. and Long.) (Optional)	Name of Team Leader: Dr. K. K. Hemalatha
Date: 26.05.2010	Time: 9 AM

N.B. Put tick mark in appropriate options. Enter the respective option number to complete Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 38 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Mountain ✓ (2) Lacustrine hill (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest (2) Grass land (3) Agriculture ✓ (4) Plantation ✓ (5) Tribal settlement ✓ (6) Human habitation ✓ (7) Township ✓ (8) Industrial area (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence (1) Some potential sources ✓ (2) Obvious sources Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs ✓ (4) Grasses ✓ (*) Others (Specify) Twiners (5) Forest plantations (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m): 200 m Stream width (m): 200 m Sampling reach area (m^2): 40000 m^2 Stream depth (m): 1.5 average Velocity:............m/ Slow.... m/min/sec. Canopy cover (%) 5% Stream Morphological Types Riffle ... - ... (%); Run ..20%.... (%); pools ..80.. (%) Channelized: (0) No ✓ (1) Yes ✓ (Bridge) Dam Present: (0) No ✓ (1) Yes
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Twiners, Bamboo, Grass, Ipomea [illegible], [illegible], [illegible], [illegible]
G. WATER QUALITY	Temperature (°C): 26°C Conductivity: Dissolved Oxygen: pH: 7.5 Chloride : 40ppm Turbidity: Slightly Alkalinity : 70 ppm Nitrite: x Hardness : 120 " Nitrate: x Calcium : 100 " Phosphate: < 0.5 PPm Magnesium : 20 " Sulphate: 200 ppm Iron : < .3 ppm Water odours: (0) None ✓ (1) Sewage (2) Petroleum (3) Chemical (4) Fishy (5) Acid (6) Other .... Water colour: (0) Colourless (1) Green (2) Brown (3) Pale greenish Turbidity (if not measured) (0) Clear (1) Slightly turbid ✓ (2) Turbid (3) Opaque (4) Stained (5) Other ....

H. BOTTOM MATERIALS a. Inorganic Materials (%)	Bedrock Boulder Cobble Gravel Sand Silt Clay (Should add up to 100%)	10% 10% 40% 20% 20%
b. Organic Materials	(1) Detritus ✓ (2) Muck Mud ✓ (3) Marl	

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET I
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: CHITTURPUZHA, TRIBUTARY OF BHARATHAPUZHA	
Name of survey site: Puzhappalam (College Jn) Lower/Middle/Upper ✓	District and Panchayath: Palakkad Dist, Chittur municipality area
GPS Reading (Lat. and Long.) (Optional)	Name of Team Leader: Dr. K.K. Hemalatha
Date: 24.05.2010	Time: 9 AM

N.B. Put tick mark in appropriate options. Enter the respective option number in complete Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 38 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Montane ✓ (2) Lacustrine (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest (2) Grassland (3) Agriculture ✓ (4) Plantation ✓ (5) Tribal settlement (6) Human habitation ✓ (7) Township ✓ (8) Industrial area ✓ (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence (1) Some potential sources ✓ (2) Obvious sources Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs ✓ (4) Grasses ✓ (*) Others (Specify) (5) Forest plantations (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m): 100 m Stream width (m): 150 m Sampling reach area (m^2): 15000 m^2 Stream depth (m): 1.5 m average Velocity: ....m/ moderate /min/sec. Canopy cover (%) 10% Stream Morphological Types Riffle ...10%... (%); Run.....50%.... (%); pools 40% (%) Channelized: (0) No (1) Yes ✓ (Bridge) Dam Present: (0) No (1) Yes ✓
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Twiners, [illegible]
G. WATER QUALITY	Temperature (°C): 29 °C Conductivity: Dissolved Oxygen: pH: 7.5 Turbidity: clear Nitrite: x Nitrate: x Phosphate: 0.5 ppm Sulphate: Wilkins 200 ppm Chloride = 90 ppm Alkalinity = 220 ppm Hardness = 280 " Calcium = 180 " Magnesium = 100 " Iron = 0.3 " Water odours: (0) None ✓ (1) Sewage (2) Petroleum (3) Chemical (4) Fishy (5) Acid (6) Other .... Water colour: (0) Colourless ✓ (1) Green (2) Brown (3).................. Turbidity (if not measured) (0) Clear ✓ (1) Slightly turbid (2) Turbid (3) Opaque (4) Stained (5) Other ....

H. BOTTOM MATERIALS	Bedrock 20% Boulder 20% Cobble Gravel 10% Sand 20% Silt 10% Clay 10% (Should add up to 100%)
a. Inorganic Materials (%)	
b. Organic Materials	(1) Detritus ✓ (2) Muck Mud ✓ (3) Mar ✗

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: GAYATHRI PUZHA, Tributary of Bharathapuzha	
Name of survey site: OOTTARA Lower/Middle/Upper: Middle	District and Panchayath: PALAKKAD DIST., KOLLEMCODE PANCHAYATH
GPS Reading (Lat. and Long. (Optional)	Name of Team Leader: DR. K.K. HEMALATHA
Date: 25.05.2010	Time: 9 AM

N.B. Put tick mark in appropriate options. Enter the respective option number in computer Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 38 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Montane ✓ (2) Lacustrine (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest (2) Grass land (3) Agriculture ✓ (4) Plantation ✓ (5) Tribal settlement (6) Human habitation ✓ (7) Township ✓ (8) Industrial area (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence (1) Some potential sources ✓ (2) Obvious sources Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs ✓ (4) Grasses ✓ (*) Others (Specify) Twines (5) Forest plantations (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m):	200m
	Stream width (m):	100 m
	Sampling reach area (m²):	20000 m²
	Stream depth (m):	1.5 m in certain regions, all other regions are ditches, at present
	Velocity:..........m/.....m/min/sec.	Slow
	Canopy cover (%)	30%
	Stream Morphological Types	
	Riffle .... (%); Run...(%); pools ...(%)	Run 80%; pools 20
	Channelized: (0) No (1) Yes	✓ (Bridges)
	Dam Present: (0) No (1) Yes	
F. AQUATIC VEGETATION	Free floating hydrophytes:	✓
	Floating but rooted hydrophytes:	✓
	Rooted and submerged hydrophytes	✓
	Suspended hydrophytes	✓
	Wetland or marsh plants	✓
	Attached algae:	✓
	Others (Specify):	Marsh Twiners, shrubs, small trees, Full of vegetation [illegible] etc.
G. WATER QUALITY	Temperature (°C):	32 °C
	Conductivity:	
	Dissolved Oxygen:	
	pH:	7.5
	Turbidity:	clear
	Nitrite:	×
	Nitrate:	×
	Phosphate:	0.5 ppm
	Sulphate:	high than 200 ppm
		Chloride = 70 ppm; Alkalinity = 400 ppm; Calcium = 270 ppm; Hardness = 510 ppm; Magnesium = 240 ppm; Iron = 0.3 ppm
	Water odours: (0) None ✓ (1) Sewage (2) Petroleum (3) Chemical (4) Fishy (5) Acid (6) Other	
	Water colour: (0) Colourless ✓ (1) Green (2) Brown (3)................	
	Turbidity (if not measured) (0) Clear ✓ (1) Slightly turbid (2) Turbid (3) Opaque (4) Stained (5) Other	

H. BOTTOM MATERIALS a. Inorganic Materials (%)	Bedrock 30% Boulder 20% Cobble 20% Gravel Sand 20% Silt 10% Clay – (Should add up to 100%)
b. Organic Materials	(1) Decritus (2) Muck Mud (3) Mar ✓ ✓

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: KALPATHYPPUZHA, Tributary of Bharathapuzha	
Name of survey site: Kalpathy palam site Lower/Middle/Upper Middle	District and Panchayath: Palakkad Dt. Palakkad Municipality
GPS Reading (Lat. and Long. (Optional)	Name of Team Leader: Dr. K K. Hemalatha
Date: 26.05.2010	Time: 12.45 pm.

A. WEATHER CONDITIONS	Sunny✓/Cloudy/Rainy (Tick) Temperature (Atmosphere): 38°C Has there been rain in the last 7 days: No
B. STREAM CHARACTERIZATION	Stream nature: Perennial / ephemeral ✓ Stream type: I/II/III✓/IV/V/VI order Stream origin: Montane✓, laterite hill, swamp, sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: forest, grass land, agriculture✓, plantation✓, tribal settlement, human habitation✓, township✓, industrial area, others (Specify) Local Watershed Nonpoint Source Pollution: No evidence. Some potential sources✓, Obvious sources Local Watershed Erosion: None, Moderate✓, Heavy
D. RIPARIAN VEGETATION	Trees✓, shrubs✓, herbs✓ and grasses✓, others (Specify) Forest plantations, agricultural plantations✓, mixed agriculture✓ No vegetation

E. INSTREAM FEATURES	Reach length (m): 200 m Stream width (m): 150 m Sampling reach area (m^2): 30000 m^2 Stream depth (m): 1.5 m average Velocity: Slow Canopy cover (%) 5% **Stream Morphological Types** Riffle ..... (%); Run.....20% (%); pools ..80.. (%) **Channelized:** Yes/ No (Bridge) **Dam Present:** Yes/No ✓
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Twiners, Bamboo
G. WATER QUALITY	Temperature (^{0}C): 28°C Conductivity: Dissolved Oxygen: pH: 7.5 Turbidity: Slightly Nitrite: x Nitrate: x Phosphate: 2.05 ppm Sulphate: 200 ppm Chloride = 100 ppm Alkalinity = 80 " Hardness = 140 " Calcium = 110 " Magnesium = 30 " Iron = 0.3 " **Water odours:** None/Sewage/ Petroleum /Chemical/ Fishy/Acid/ Other ..... **Water colour:** Colourless/green/brown/.....Pale greenish **Turbidity (if not measured)** Clear/Slightly turbid/Turbid/Opaque/Stained/Other .....Slightly Turbid

H. INORGANIC MATERIALS (%)	Bedrock 20 % Boulder Cobble Gravel Sand 30 % Silt 30 % Clay 20 % (Should add up to 100%)
I. ORGANIC MATERIALS	Detrjtus/Muck Mud/Marl ✓ ✓ × (Tick)

ANNEXURE - DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: CHITTURPUZHA, TRIBUTARY OF BHARATHAPUZHA	
Name of survey site: PARLI CHECK DAM Lower/Middle/Upper LOWER	District and Panchayath: Palakkad Dist., Parli Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team Leader: Dr. K. K. Hemalatha
Date: 27.05.2010	Time: 3.30 pm.

J. WEATHER CONDITIONS	Sunny/Cloudy/Rainy (Tick) Temperature (Atmosphere): 38°C Has there been rain in the last 7 days: No
K. STREAM CHARACTERIZATION	Stream nature: Perennial / ephemeral ✓ Stream type: I/II/III/IV/V/VI order Stream origin: Montane, laterite hill, swamp, sacred grove
L. WATERSHED FEATURES	Predominant Surrounding Land Use Type: forest, grass land, agriculture, plantation, tribal settlement, human habitation, township, industrial area, others (Specify) Local Watershed Nonpoint Source Pollution: No evidence. Some potential sources, Obvious sources Local Watershed Erosion: None, Moderate, Heavy
M. RIPARIAN VEGETATION	Trees, shrubs, herbs and grasses, others (Specify) marshy plants Forest plantations, agricultural plantations, mixed agriculture No vegetation

N. INSTREAM FEATURES	Reach length (m): 250 m Stream width (m): 250 m Sampling reach area (m^2): 62500 m^2 Stream depth (m): 1.5 m average Velocity: moderate Canopy cover (%) 10% **Stream Morphological Types** Riffle 10% (%); Run 40% (%); pools 50% (%) **Channelized:** Yes/ No **Dam Present:** Yes/No Check dam
O. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Bamboo
P. WATER QUALITY	Temperature (°C): 28°C Conductivity: Dissolved Oxygen: pH: 7.5 Chloride = 210 ppm Turbidity: Slightly Alkalinity = 190 " Nitrite: x Hardness = 330 " Nitrate: x Calcium = 290 " Phosphate: 0.5 ppm Magnesium = 40 " Sulphate: >200 ppm Iron = 0.3 " **Water odours:** None/Sewage/ Petroleum /Chemical/ Fishy/Acid/ Other ..... **Water colour:** Colourless/green/brown/.... Slightly greenish **Turbidity (if not measured)** Clear/Slightly Turbid/Turbid/Opaque/Stained/Other .....

Q. INORGANIC MATERIALS (%)	Bedrock 30% Boulder Cobble Gravel 10% Sand 20% Silt 20% Clay 20% (Should add up to 100%)
R. ORGANIC MATERIALS	Detritus/Muck Mud/Marl (Tick)

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: GAYATHRIPUZHA, Tributary of BHARATHAPUZHA	
Name of survey site: MAYANNUR Lower/Middle/Upper LOWER	District and Panchayath: PALAKKAD DIST, MAYANNUR Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team Leader: Dr. K. K. HEMALATHA
Date: 27.05.2010	Time: 9 AM

A. WEATHER CONDITIONS	Sunny/Cloudy/Rainy (Tick) Temperature (Atmosphere): 39°C Has there been rain in the last 7 days: NO
B. STREAM CHARACTERIZATION	Stream nature: Perennial / ephemeral ✓ Stream type: I/II/III/IV/V/VI order Stream origin: Montane, laterite hill, swamp, sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: forest, grass land, agriculture, plantation, tribal settlement, human habitation, township, industrial area, others (Specify) Local Watershed Nonpoint Source Pollution: No evidence. Some potential sources, Obvious sources Local Watershed Erosion: None, Moderate, Heavy
D. RIPARIAN VEGETATION	Trees, shrubs, herbs and grasses, others (Specify) Twiners Forest plantations, agricultural plantations, mixed agriculture No vegetation

E. INSTREAM FEATURES	Reach length (m): 300m Stream width (m): 200m Sampling reach area (m^2): 60000 m^2 Stream depth (m): 1.5m average Velocity: Moderate Canopy cover (%) 10% **Stream Morphological Types** Riffle 10% (%); Run 50% (%); pools 40% (%) **Channelized:** Yes/ No Bridge **Dam Present:** Yes/No ✓
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Hydrocyanthi Ipomea, Bamboo
G. WATER QUALITY	Temperature (°C): 28°C Conductivity: Dissolved Oxygen: pH: 7.5 Turbidity: Clear Nitrite: x Nitrate: x Phosphate: 0.5 ppm Sulphate: highest 200ppm Chloride = 70 ppm Alkalinity = 800 " Calcium = 240 " Magnesium = 240 " Hardness = 480 " Iron = 0.3 " **Water odours:** None/Sewage/ Petroleum /Chemical/ Fishy/Acid/ Other ..... **Water colour:** Colourless/green/brown/..... **Turbidity (if not measured)** Clear/Slightly turbid/Turbid/Opaque/Stained/Other .....

H. INORGANIC MATERIALS (%)	Bedrock	5%
	Boulder	10%
	Cobble	15%
	Gravel	
	Sand	30%
	Silt	30%
	Clay	10%
	(Should add up to 100%)	
I. ORGANIC MATERIALS	Detritus/Muck Mud/Marl ✓ ✓ (Tick)	

ANNEXURE: DATA SHEETS

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 1
PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(Use separate sheets for High/Mid/Low lands)

Name of the River: KALPATHY PUZHA	
Name of survey site: PARLI PALAM Lower/Middle/Upper LOWER	District and Panchayath: PALAKKAD DIST., PARLI PANCHAYATH
GPS Reading (Lat. and Long. (Optional)	Name of Team Leader: DR. K. K. HEMA LATHA
Date: 26.05.2010	Time: 03.30 pm

N.B. Put tick mark in appropriate options. Enter the respective option number in computer Excel sheet.

A. WEATHER CONDITIONS	(1) Sunny ✓ (2) Cloudy (3) Rainy Temperature (Atmosphere): 38 °C Has there been rain in the last 7 days: (1) No ✓ (2) Yes
B. STREAM CHARACTERIZATION	Stream nature: (1) Perennial (2) Ephemeral ✓ Stream type: (1) I (2) II (3) III ✓ (4) IV (5) V (6) VI order Stream origin: (1) Montane ✓ (2) Lacustro hill (3) Swamp (4) Sacred grove
C. WATERSHED FEATURES	Predominant Surrounding Land Use Type: (1) Forest (2) Grass land (3) Agriculture ✓ (4) Plantation (5) Tribal settlement (6) Human habitation ✓ (7) Township ✓ (8) Industrial area (9) Others (Specify) Local Watershed Nonpoint Source Pollution: (0) No evidence (1) Some potential sources ✓ (2) Obvious sources Local Watershed Erosion: (0) None (1) Moderate ✓ (2) Heavy
D. RIPARIAN VEGETATION	(1) Trees ✓ (2) Shrubs ✓ (3) Herbs (4) Grasses ✓ (*) Others (Specify) Twiners (5) Forest plantations (6) Agricultural plantations ✓ (7) Mixed agriculture ✓ (0) No vegetation

E. INSTREAM FEATURES	Reach length (m): 300m Stream width (m): 200m Sampling reach area (m^2): 60000m^2 Stream depth (m): 2m average Velocity: moderate fast/mid/slow Canopy cover (%) 10% Stream Morphological Types Riffle 10% (%); Run 50% (%); pools 40 (%) Channelized: (0) No (1) Yes ✓ (Bridge) Dam Present: (0) No ✓ (1) Yes
F. AQUATIC VEGETATION	Free floating hydrophytes: ✓ Floating but rooted hydrophytes: ✓ Rooted and submerged hydrophytes ✓ Suspended hydrophytes ✓ Wetland or marsh plants ✓ Attached algae: ✓ Others (Specify): Twiners, common grass, Ipomea sp. Bamboo
G. WATER QUALITY	Temperature (°C): 29°C Conductivity: Dissolved Oxygen: pH: 7.5 Turbidity: slightly Nitrite: x Nitrate: x Phosphate: 0.5PPm Sulphate: >200 ppm Chloride : 220 ppm Alkalinity : 190 " Hardness : 340 " Calcium : 200 " Magnesium = 40 " Iron : 0.3 " Water odours: (0) None (1) Sewage ✓ (2) Petroleum foulsmelling (3) Chemical (4) Fishy (5) Acrid (6) Other ..... Water colour: (0) Colourless (1) Green (2) Brown (3) Straw colour Turbidity (if not measured) (0) Clear (1) Slightly turbid ✓ (2) Turbid (3) Opaque (4) Stained (5) Other .....

H. BOTTOM MATERIALS a. Inorganic Materials (%)	Bedrock Boulder Cobble Gravel Sand Silt Clay (Should add up to 100%)	30% — — 10% 20% 20% 20%
b. Organic Materials	(1) Detritus (2) Muck Mud (3) Mar ✓ ✓ ^	

FISH MONITORING PROGRAMME (KSEB)

DATA SHEET 2
A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA'S TRIBUTARY Name of the tributary (if any): CHITTURPUZHA	
Name of survey site: Kunnamkathupathy Highland/Midland/Lowland ✓	District and Panchayath: Palakkad dist, Perumatty panchayath, Chittur
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. Hemalatha
Date: 24.05.2010	Time: 1 Pm.
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito net ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hr. - Castnet ① 2. One hr - Gillnet-① 3. 2hrs - Gillnet ② 4. Mosquito net - Random 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciation; Others: nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2
A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: GAYATHRIPUZHA, TRIBUTARY OF BHARATHAPUZHA Name of the tributary (if any):	
Name of survey site: Seetharkundu Highland✓/Midland/Lowland	District and Panchayath: Palakkad dist., Kollemcode Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. HEMALATHA
Date: 25.05.2010	Time: 01.10 Pm
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hour – Cast net (1) 2. One hour – Gill net (1) 3. Twoo hours – Gill net (2) 4. Randow – mosquito net 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others Nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2
A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA Name of the tributary (if any): KALPATHY PUZHA	
Name of survey site: KADUKKAMKUNNU Highland/Midland/Lowland NILAMPATHY HIGH LAND	District and Panchayath: PALAKKAD DT. Palakkad municipality
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. HEMALATHA
Date: 26.05.'10	Time: 9 AM
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hour - Cast net 2. One hour - Gill net (1) 3. 2 hours - Gill net (2) 4. Mosquito Net - Random 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multple anomalies; Emaciated; Others: nil	

FISH MONITORING PROGRAMME (KSHEC)

DATA SHEET 2
A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: Bharathapuzha's Tributary Name of the tributary (if any): CHITTUR PUZHA	
Name of survey site: Puzhappalam (Chittur College Jn) Highland/Midland/Lowland ✓	District and Panchayath: Palakkad Dist., Chittur Municipality
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. Hemalatha
Date: 24.05.10	Time: 9 AM
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hr – Cast net ① 2. One hr – Gill net ① 3. Two hrs – Gill net ② 4. Mosquito net – Random 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others nil	

FISH MONITORING PROGRAMME (KSEB)

DATA SHEET 2

A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA Name of the tributary (if any): GAYATHRIPUZHA	
Name of survey site: OTTARA Highland/Midland/Lowland ✓	District and Panchayath: PALAKKAD DIST, Kollemcode panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K. K. HEMALATHA
Date: 25. 05. 2010	Time: 9 AM
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hour - Cast net (1) 2. One hour - Gill net (1) 3. 2 hours - Gill net (II) 4. Mosquito net - Random 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others Nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2

A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPPUZHA UPPER CATCHMENT Name of the tributary (if any): KALPATHYPPUZHA	
Name of survey site: Kalpathy ppalam Highland/Midland/Lowland mid land	District and Panchayath: Palakkad dt. Palakkad municipality
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K. K. HEMALATHA
Date: 26.05.2010	Time: 12.45 PM
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. Cast net One hr. 2. Gill net I One hr. 3. Gill net II Two hrs. 4. Mosquito net random. 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2

B. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA Name of the tributary (if any): CHITTURPUZHA	
Name of survey site: Parli Chekdam Highland/Midland/Lowland ✓	District and Panchayath: Palakkad, Parli Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. Hemalatha
Date: 27-05-10	Time: 3-30 pm.
Types of nets used: 6. Cast net ✓ 7. Gill net ✓ 8. Trap 9. Mosquito cloth ✓ 10. Other methods (specify)	Sampling duration for each net (minutes): 1. One hr. Cast net 2. One hr - Gill net 1 3. Two hrs. - Gill net 2 4. Mosquito net - Random. 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others Nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2

A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA Name of the tributary (if any): GAYATHRIPUZHA	
Name of survey site: Mayannur Highland/Midland/Lowland ✓	District and Panchayath: Palakkad, Mayannur Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. Hemalatha
Date: 27.05.2010	Time: 09 AM
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hour Cast 2. One hr Gill net I 3. Two hrs Gill net II 4. Mesquito net Random. 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others: nil	

FISH MONITORING PROGRAMME (KSBB)

DATA SHEET 2

A. FISH SAMPLING FIELD DATA SHEET (PRIMARY DATA)

(Use separate sheets for high/mid/low lands)

Name of the River: BHARATHAPUZHA Name of the tributary (if any): KALPATHY PUZHA	
Name of survey site: Parliappalam Highland/Midland/Lowland ✓	District and Panchayath: Palakkad dt. Parli Panchayath
GPS Reading (Lat. and Long. (Optional)	Name of Team leader: Dr. K.K. HEMALATHA
Date: 26.05.'10	Time: 01.30 pm -
Types of nets used: 1. Cast net ✓ 2. Gill net ✓ 3. Trap 4. Mosquito cloth ✓ 5. Other methods (specify)	Sampling duration for each net (minutes): 1. One hr - Cast net 2. One hr - Gill net (I) 3. Two hrs. - Gill net (II) 4. Mosquito net - Random 5.
Anomalies recorded in fish (if any): Deformities; Eroded fins; Fungus; Lesions; Multiple anomalies; Emaciated; Others: nil	

Chittapuzha

A. Primary Data Collection – Direct Sampling

Sr. No.	Fish Species	Station I (Highland) ✓/ Station II (Midland)/ Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Others Nets 1 (Scoop)	Gill Net II	Others Nets 3	Total
①	Tilapia	1	1	–	–	–	–	–	–	–	–	–	–	1		2
②	P. filamentosus	3	2	–	3	1	–	4	–	7	5	2	–	–		27
③	P. fasciatus	–	–	–	–	–	–	–	–	–	–	2	4	–		6
④	Etroplus Suratensis	2	2	–	–	–	–	–	–	–	–	2	–	2		8
⑤	Etroplus maculatus	–	3	–	–	–	–	–	–	–	–	–	–	–		3
⑥	Catla catla	–	2	–	–	–	–	–	–	–	–	–	–	–		2
⑦	Heteropneustes fossilis	–	–	–	–	–	–	–	–	–	–	1	–	1		2
⑧	Wallago attu (Koi)	–	–	–	–	–	–	–	–	–	–	–	4	–		4
⑨	Mystus carnatus	–	–	–	–	–	–	–	–	–	–	3	–	5		8
⑩	Channa (Aralli)	–	–	–	–	–	–	–	–	–	–	–	>100	–		>100
10	Rasbora daniconius	–	2	–	–	–	2	–	–	–	1	3	–			8
11	Garra mullya	–	–	–	–	–	–	–	–	–	–	1	5	–		6
12	Barilius gatensis	–	–	–	–	–	–	–	–	–	–	–	12	–		12
13	Parambassis thomassi	–	–	–	–	–	–	–	–	–	–	1	–	1		2
14	Clarias dussumieri	–	–	–	–	–	–	–	–	–	–	2	–	–		2
15	Lepidocephalichthys thermalis	–	–	–	–	–	–	–	–	–	–	–	2	–		2
16	Amblypharyngodon microlepis	–	4	8	3	6	–	9	1	12	–	4	21	3		71

Gayathri

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland) ✓ / Station II (Midland) / Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Drive Net 1 (Mogy)	Gill Net II	Drive Net 3	Total
①	Bhawania anatirostris	–	–	–	–	–	–	–	–	–	–	–	15	1		15
②	Rasbora elanga (Rasbora daniconius elanga)	–	–	–	–	–	–	–	–	–	–	–	4	–		4
③	Puntius filamentosus	4	4	2	2	–	4	–	2	6	–	2	4	–		30
	"	–	–	–	–	–	–	–	–	–	–	4	–	–		4
	"	3	2	–	–	–	–	–	–	–	–	–	2	–		7
④	Puntius fasciatus	–	–	–	–	–	–	–	–	–	–	–	11	–		11
⑤	Etroplus suratensis	4	–	–	–	–	–	–	–	–	–	–	–	–		4
⑥	Channa (Ophicephalus) striatus	–	–	–	–	–	–	–	–	–	–	–	numerous			numerous
⑦	H. fossilis	–	–	–	–	–	1	–	–	–	–	3	–	–		4
8	Amblypharyngodon microlepis	–	3	–	5	–	2	1	1	2	2	17	2			35
9	Gara mullya	–	–	–	–	–	–	–	–	–	–	1	2	1		4
10	Lepidocephalichthys thermalis	–	–	–	–	–	–	–	–	–	–	1	6	1		8
11	Clarias batrachus	–	–	–	–	–	–	–	–	–	–	1	1	1		3
12	Bavitilus gatensis		6	–	–	1	–	2	–	4	2	4	1			20

Kalpathypuzha

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland)														Total
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Gill Nets II	Other Nets 2	Other Nets 3	
1	P. filamentosus	3	2	–	–	5	–	–	3	3	2	2	1	3		24
2	P. fasciatus	–	–	–	–	–	–	–	1	–	–	1	1	18		20
3	Catla catla	–	–	2	–	–	–	–	–	–	–	–	–	–		2
4	H. fossilis	–	–	–	–	–	–	1	–	–	–	1	–	–		1
5	Barilius gatensis	–	–	3	–	–	–	3	–	–	4	–	2	1		13
6	Amblypharyngodon thirmalis	–	–	–	3	2	4	–	1	1	3	1	1	18		34
7	Rasbora dani.	–	–	–	–	–	–	–	–	–	1	–	1	8		10
8	Mystus cavas.	–	–	–	–	–	–	–	–	–	–	1	1	–		2
9	Labeo rohita	–	–	–	–	–	–	–	1	–	–	–	–	–		1
10	Gara mullya	–	–	–	–	–	–	–	–	–	–	–	–	6		6
11	Tilapia	–	–	–	2	–	–	–	–	–	–	1	–	–		3
12	Clarias dussumieri	–	–	–	–	–	–	–	–	–	–	–	1	–		1
13	Channa striatus	–	–	–	–	–	–	–	–	–	–	1	–	–		1
14	Parambaia thomasi	–	–	–	–	1	–	–	–	1	–	–	–	–		2

Chittupuzha :

A. Primary Data Collection – Direct Sampling

Sr. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Other Nets 1 (Mesh)	Gill Net II	Other Nets 3	Total
①	Punt. filamentosus	–	8	2	9	6	8	–	–	4	6	3	–	1		47
②	Etroplus suratensis	–	–	–	–	3	–	–	–	–	–	–	–	2		5
③	Pun. filamentosus	–	–	–	–	2	3	–	–	–	–	–	–	3		8
④	Channa (hahlig)	–	–	–	–	–	–	–	–	–	–	–	numerous			numerous
⑤	Mystus cavasius	–	–	3	–	–	–	–	–	1	–	3	1	1		9
⑥	P. fasciatus	–	–	–	–	–	–	–	–	–	–	–	12			12
⑦	Barbichthys laticlavius	–	–	–	–	–	–	–	–	–	–	3	4	2		9
⑧	Eel					–	–					3	–	–		3
⑩	Wallago attu	–	–	–	–	–	1	–	–	–	–	–	–	–		1
⑪	Tilapia	–	–	–	–	3	–	–	–	–	–	6	–	6		15
⑫	Rasbora daniconius	–	2	2	–	–	3	–	3	–	2	4	2			18
13	Clarias dussumieri	–	–	–	–	–	–	–	1	–	1	1	1			4
14	Garra mullya		–	–	–	–	–	–	–	–	1	2	–			3
15	Amblypharyngodon microlepis	–	4	3	5	1	–	6	2	6	27	3				57

Gayathri

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Gill Net 2	Other Nets 2	Other Nets 3	Total
①	P. filamentosus	6	–	3	4	3	2	–	2	6	8	1		5		40
②	Etroplus suratensis	–	–	–	–	–	2	–	–	–	–	2	2	–		6
③	Wallago attu (larvae)	–	–	–	–	–	–	–	–	–	–	–	1	2		3
④	Channa (fry)	–	–	–	–	–	–	–	–	–	–	–	→	>150		>150
⑤	Pun. filamentosus	–	–	–	–	4	–	–	–	–	–	–	–	–		4
⑥	P. fasciatus	–	–	–	–	–	–	–	–	–	–	5	5	13		23
⑦	Mastacembelus triangularis	–	–	–	–	–	–	–	–	–	–	–	–	1		1
8	Tilapia	–	–	–	–	2	–	–	–	–		1	1			4
9	Gara mullya	–	–	–	–	–	–	–	–	–	–	2	2	1		5
10	Lepidocephalichthys thermalis	–	–	–	–	–	–	–	–	–	–	3	4	2		9
11	Clarias dussumieri	–	–	–	–	–	–	–	–	–	–	1	1	2		4
12	Mystus (Controlling)											1		1		2
13	Channa Striatus	–	–	–	–	–	–	–	–	–	–	2	–	1		3
14	Parambassis thomassi	–	–	–	–	–	1	–	–	–	–	2	1	1		5
15	Amblypharyngodon microlepis	3	–	4	–	2	8					1	1	25		44
16	Rasbora daniconius	1	1	–	2	1	2	4	1	1	1	1	1	–		14
17	Barilius gatensis					1				1	2	2	2	1		9

Kalpathiyapuzha

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Gill Net 2	Drift Net 2	Hooking 3	Total
①	P. fasciatus	–	–	–	–	–	–	–	–	–	–	–	8	10		12
②	Catla catla	–	–	–	–	–	–	–	–	–	–	2	–			2
③	Labeo rohita	–	–	–	–	–	–	–	–	–	–	1	1			2
④	Wallago Attu	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
⑤	Eel	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2
⑥	Puntius filamentosus	–	–	–	–	–	–	–	–	–	–	18	9	–		27
7	Mrigal	–	–	–	–	–	–	–	–	–	–	1	–	–		1
8	H. fossilis	–	–	–	–	–	–	–	–	–	–	2	1	2		5
⑨	Etroplus suratensis	–	–	–	–	–	–	–	–	–	–	1	–	1		2
10	Tilapia	–	–	–	–	–	–	–	–	–	–	1	1	1		3
11	Amblypharyngodon mitrolepis	–	–	–	–	–	–	–	–	–	–	4	3	26		33
12	Barilius gatensis	–	–	–	–	–	–	–	–	–	–	2	1	4		7
13	Clarias dussumieri	–	–	–	–	–	–	–	–	–	–	1	2	1		4
14	Mystus cavasius	–	–	–	–	–	–	–	–	–	–	1	1	–		2
15	Gaora mullya	–	–	–	–	–	–	–	–	–	–	–	2	–		2

Chittarpuzha

C. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) ✓														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Gill Nets 1	Gill Nets 2	Other Nets 3	Total
1	D. filamentosus	–	–	–	–	–	–					2	12	6		20
2	P. fasciatus											6	12	4		22
3	Eel (V small)											1	–	–		1
4	Catla catla											2	–	–		2
5	Labeo rohita											1	–	–		1
6	Tilapia											3		–		3
7	Amblyp. microlepis											14	12	6		32
8	Barbis gatensis											2	8	4		14
9	Nellaya attu (small)											1	–	–		1
10	Garra mullya											2	1	3		6
11	Mystus cavasius											1	–	–		1
12	H. fossilis (small)											1	–	–		1

Gayathrmpuzha

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) ✓														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Mosquito Nets 1	Gillnet Nets 2	Other Nets 3	Total
①	P. filamentosus	12	3	7	5	8	–	4	3	2	0	4	8	1		57
②	Etroplus Suratensis	–	–	–	–	–	1	–	–	–	–	–	–	1		2
③	Wallago attu	–	–	–	–	–	–	–	–	–	–	–	–	1		1
4	H. fossilis	–	–	1	–	–	–	–	–	–	–	–	–	–		1
5	P. fasciatus	2	1	2	6	–	4	–	2	1	1	4	10	–		33
6	Tilapia	2	1	1	–	2	–	1	1	–	–	–	–	–		8
7	Garra mulya	–	–	–	–	–	–	–	–	–	–	1	1	1		3
8	Parambassis Thomasi	1	1	2	3	4	3	2	2	–	1	1	2	–		22
												–	–	–		
9	Amblypharyngodon microlepis	2	1	2	–	8	2	2	2	2	1	2	21	–		45
												–	–	–		
10	Rasbora daniconius	2	1	1	–	1	2	1	1	1	–	–	–	–		10
11	Mystus Cavasius	–	–	2	–	–	–	–	–	1	–	–	–	–		3
12	Channa striatus	–	–	–	1	1	–	–	–	–	–	–	–	–		2

Kalpathypuzha

A. Primary Data Collection – Direct Sampling

Sl. No.	Fish Species	Station I (Highland)/ Station II (Midland)/ Station III (Lowland) – No. of fishes														
		Cast Net 1	Cast Net 2	Cast Net 3	Cast Net 4	Cast Net 5	Cast Net 6	Cast Net 7	Cast Net 8	Cast Net 9	Cast Net 10	Gill Net 1	Gill Net (11)	Other Nets 2	Other Nets 3	Total
1	Catla catla	–	–	–	–	–	–	–	–	–	–	1	–	–		1
2	Labeo rohita	–	–	–	–	–	–	–	–	–	–	–	1	–		1
3	P. fasciatus	–	–	–	–	–	–	–	–	–	–	–	1	12		13
4	P. filamentosus	–	–	–	–	–	–	–	–	–	–	6	4	10		20
5	Mastacembelus armatus	–	–	–	–	–	–	–	–	–	–	–	–	3		3
6	H. fossilis	–	–	–	–	–	–	–	–	–	–	1	–	1		2
7	Etroplus suratensis	–	–	–	–	–	–	–	–	–	–	3	2	1		6
8	Wallago attu	–	–	–	–	–	–	–	–	–	–	–	1	–		1
9	Mystus cavasius	–	–	–	–	–	–	–	–	–	–	–	1	6		7
10	Tilapia	–	–	–	–	–	–	–	–	–	–	3	2	2		7
11	Barbodes gatensis	–	–	–	–	–	–	–	–	–	–	2	2	2		6
12	Hypselobarbus dimbatus	–	–	–	–	–	–	–	–	–	–	1	1	–		2
13	Amblypharyngodon mola / Esomus danricus	–	–	–	–	–	–	–	–	–	–	8	7	31		46
14	Rasbora daniconius	–	–	–	–	–	–	–	–	–	–	2	2	4		8

Chittarpuzha

D. Primary Data Collection – Market Survey

(Use separate sheets for high/mid/low lands)

Sl. No.	Fish Species / Group	Market Analysis															
		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12	Sample 13	Sample 14	Sample 15	Total

No riverine fishes were noticed in the market

Gayathri

B. Primary Data Collection – Market Survey

(Use separate sheets for high/mid/low lands)

Sl. No.	Fish Species / Group	Market Analysis															
		Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	Sample 11	Sample 12	Sample 13	Sample 14	Sample 15	Total

Riverine
No fishes were observed in the market.

~~ANNEXURE~~: DATA SHEETS

Kalpathypuzha

✓ ✓ ✓

Sl. No.	Fish Species / Group	Market Analysis (No. of fishes)															
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	Total
		01.11.2021	02.11.2021	03.11.2021	04.11.2021	05.11.2021	06.11.2021	07.11.2021	08.11.2021	09.11.2021	10.11.2021	11.11.2021	12.11.2021	13.11.2021	14.11.2021	15.11.2021	

No riverine fish were seen in the market. Fresh water fishes from Malampuzha Dam and from Culturing agencies were sold in the market.

Chittarpuzha

Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sr. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For fish, Drinking water, irrigation
2	The number of fishermen depended on fishing in the sampling area	No body is doing fishing as a job. People catch fish for their own need.
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same. (use separate sheet, if needed)	Yes. Sand mining causes the water level decrease in the well & ground water level. That leads to the vegetation of large plants throughout the riverbed. & Encroachment decreases the river area.
4	List (local names) of fish available in the river system (use separate sheet, if needed)	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	Eel
6	The species (mainly fish) that are once common in the area and disappeared recently	not noticed
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	Gray Wage Tail migratory bird
8	Is there any major change in habitat structure? If yes, list them	Abundant Vegetation, Sand mining, Water present in ditches and pool like areas
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	Not observed
10	What are the common fishing practices available in the region?	Hook, gill net use
11	Is there any unscientific methods practiced (eg. Dynamiting, poisoning, adakkam kolli vala, etc.)	not noticed
12	Any fish diseases outbreak observed till date?	not noticed
13	Any traditional knowledge on fish available in the area	no
14	Suggestions on conservation of fish (as perceived by the local communities)	Restrict Sand mining and deforestation.

Gayathri

Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sl. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For irrigation agriculture & easily available water. Due to the easy availability of water
2	The number of fishermen depended on fishing in the sampling area	none
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same. (use separate sheet, if needed)	Water quantity is reduced at present. May be due to lack of rain in the forest
4	List (local names) of fish available in the river system (use separate sheet, if needed)	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	[illegible] (Puntius filamentosus)
6	The species (mainly fish) that are once common in the area and disappeared recently	nil
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc.)	no
8	Is there any major change in habitat structure? If yes, list them	Yes. Due to anthropogenic activities. Like any other region plastic bottles & cups are dumped in this region also.
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	not noted
10	What are the common fishing practices available in the region?	It is not a fishing area
11	Is there any unscientific methods practised (eg. Dynamiting, poisoning, adakkam kolli vala, etc.)	nil
12	Any fish diseases outbreak observed till date?	nil
13	Any traditional knowledge on fish available in the area	nil
14	Suggestions on conservation of fish (as perceived by the local communities)	Protect the area in all sense. People who violate the rules should be punished.

Kalpathypuzha

Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sl. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For fish, agriculture and other anthropogenic activities
2	The number of fishermen depended on fishing in the sampling area	No such group was observed. Here people do fishing for daily use.
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same. (use separate sheet, if needed)	Yes. Due to vegetation, erosion, encroachment, sand mining and due to poor availability of rain, water quantity and fish availability are decreased.
4	List (local names) of fish available in the river system (use separate sheet, if needed)	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	Etroplus, Eel, Heteropneustes, Wallago attu
6	The species (mainly fish) that are once common in the area and disappeared recently	not known
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	Not observed
8	Is there any major change in habitat structure? If yes, list them	Yes. Full of vegetation and sand mining, the riverine structure is totally changed and we could not even use cast net for fishing.
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	not noticed.
10	What are the common fishing practices available in the region?	Hooking & Gill net
11	Is there any unscientific methods practised (eg. Dynamiting, poisoning, adakkam kolli vala, etc.)	not noticed
12	Any fish diseases outbreak observed till date?	no
13	Any traditional knowledge on fish available in the area	no
14	Suggestions on conservation of fish (as perceived by the local communities)	Here the River is completely destroyed due to Sand mining. It should be checked by Law. Strong Punishment to those who violate and only can save our Rivers

C. Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sl. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For fishing, for drinking water Bathing
2	The number of fishermen depended on fishing in the sampling area	People catch fish for their daily use.
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same.	Yes. Now the river is full of vegetation, erosion and sand mining also heavy. River bed is with ditches filled with clay
4	List (local names) of fish available in the river system	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	Eel, Etroplus, Wallago attu, Channa
6	The species (mainly fish) that are once common in the area and disappeared recently	not known
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	migratory Grey wagetail bird
8	Is there any major change in habitat structure? If yes, list them	Full Vegetation Sand mining
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	Otter present. But people from outside country come and kill them in large scale and now the number very much decreased
10	What are the common fishing practices available in the region?	Hook, cast net, gill net and in the bridge region use the large fishing net.
11	Is there any unscientific methods practised	

	(eg. Dynamiting, poisoning, *adakkam kolli vala*, etc.)	not noticed
12	Any traditional knowledge on fish available in the area	no
13	Suggestions on conservation of fish (as perceived by the local communities)	Restrict sand mining that destroys the river bed.

Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sr. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For Agriculture, fish and other anthropogenic activities.
2	The number of fishermen depended on fishing in the sampling area	No such group was noticed.
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same. (use separate sheet, if needed)	Yes. Due to sand mining dumping of butchery wastes in the river and due to vegetation
4	List (local names) of fish available in the river system (use separate sheet, if needed)	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	Etroplus, Eel, Heteropneustes, Wallago attu, Ophiocephalus,
6	The species (mainly fish) that are once common in the area and disappeared recently	not observed
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	Not known.
8	Is there any major change in habitat structure? If yes, list them	Yes. Full vegetation & Sand mining the riverine structure is totally changed
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	not noticed
10	What are the common fishing practices available in the region?	Hooking & Gill net
11	Is there any unscientific methods practised (eg. Dynamiting, poisoning, mukkum kotti vala, etc.)	not noticed
12	Any fish diseases outbreak observed till date?	no
13	Any traditional knowledge on fish available in the area	no
14	Suggestions on conservation of fish (as perceived by the local communities)	Destroy of river should be checked by Law. Those who violate law should be punished. Strong punishments only can save our rivers.

C. Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low lands)

Sl. No.	Question	Answer
1	The reasons for dependence of local communities on river.	For, fish, Agriculture, and other activities
2	The number of fishermen depended on fishing in the sampling area	no such group was noticed.
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same.	Yes. may be due to vegetation erosion, encroachment, sand mining, and may be due to poor availability of rain
4	List (local names) of fish available in the river system	[illegible]
5	The species (mainly fish) that have declined in availability (abundance)	B. [illegible], Wallago attu, H. fossilis, eel
6	The species (mainly fish) that are once common in the area and disappeared recently	not observed
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	not noticed
8	Is there any major change in habitat structure? If yes, list them	Yes. River structure is converted to full green vegetation, Sand mining converted (in) river bed to ditches and soft marshy land.
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	not known
10	What are the common fishing practices available in the region?	Hooking, gill net use
11	Is there any unscientific methods practised (eg. Dynamiting, poisoning, *adukkam kolli vala,* etc.)	not known
12	Any traditional knowledge on fish available in the area	no
13	Suggestions on conservation of fish (as perceived by the local communities)	Sand mining and too much of checkdams completely destroyed the fauna of the river; both should be checked.

Chitturpuzha, Gayathripuzha & Kalpathypuzha

Secondary Data Collection – Historical Data

(Use separate sheets for high/mid/low land)

Sl. No.	Question	Answer
1	The reasons for dependence of local communities on river.	
2	The number of fishermen depended on fishing in the sampling area	
3	Is there any change in the services (water including ground water, sand, fish) offered by the river over the years? If yes, reasons for the same. (use separate sheet, if needed)	
4	List (local names) of fish available in the river system (use separate sheet, if needed)	
5	The species (mainly fish) that have declined in availability (abundance)	As in other Locations.
6	The species (mainly fish) that are once common in the area and disappeared recently	
7	Is there any new addition of flora and fauna in the region (eg. Exotic fish, fish eating birds, etc)	
8	Is there any major change in habitat structure? If yes, list them	
9	Is there any animal that dependent on the river (eg. Otter) disappeared in recent times	
10	What are the common fishing practices available in the region?	
11	Is there any unscientific methods practised (eg. Dynamiting, poisoning, adakkam kolli vala, etc.)	
12	Any fish diseases outbreak observed till date?	
13	Any traditional knowledge on fish available in the area	
14	Suggestions on conservation of fish (as perceived by the local communities)	

Table 1

List of Fish Species Collected from ...**Chitturpuzha, the Upper catchment area of Bharathapuzha...**Kerala

Sl.no.	Name of Species	No. of organisms collected			Remarks
		High	Mid	Low	
1	Tilapia	2	15	3	
2	P.filamentosus	27	55	20	
3	P.fasciatus	6	12	22	
4	Etroplus suratensis	11	5	-	
5	Catlacatla	2	-	2	
6	H.fossilis	2	-	1	
7	Wallago attu (fry)	4	1	1	
8	Mys.cavasius	8	9	1	
9	Channa hatchlings	>150	Numer.	-	
10	Ras.daniconius	8	18	-	
11	Garra mullya	6	3	6	
12	Bari.gatensis	12	9	14	
13	Param.thomassi	2	-	-	
14	Cla.dussumieri	2	4	-	
15	Lepido.thermalis	2	-	-	
16	Ambly.microlepis	71	57	32	
17	Anguilla	-	3	1	
18	Labeo rohita	-	-	1	

Sixteen species were caught from high land, thirteen species from mid land and only twelve species were caught from the low land of Chitturpuzha.

Table 1

List of Fish Species Collected from ... **Gayathripuzha, the Upper catchment area of Bharathapuzha...** Kerala

Sl.no.	Name of Species	No. of organisms collected			Remarks
		High	Mid	Low	
1	Bhawania australis	15	-	-	
2	Noemacheilus triangularis	4	1	-	
3	P.filamentosus	41	44	57	
4	P.fasciatus	11	23	33	
5	Etroplus suratensis	4	6	2	
6	Channa hatchlings	Numer.	>150	-	
7	H.fossilis	4	-	1	
8	Ambly.microlepis	35	44	45	
9	Garra mullya	4	5	3	
10	Lepido.thermalis	8	9	-	
11	Channa striatus	3	3	2	
12	Barilius gatensis	20	9	-	
13	Wallago attu	-	3	1	
14	Tilapia	-	4	8	
15	Clarius dussumieri	-	4	-	
16	Mys. cavasius	-	2	3	
17	Ras. daniconius	-	14	10	
18	Param. thomassi	-	5	22	

Twelve species were collected from the High land, sixteen species were caught from the mid land where as twelve species were collected from the low land of Gayathripuzha.

Table 1

List of Fish Species Collected from ... **Kalpathyppuzha, the upper catchment area of Bharathapuzha,** Kerala

Sl.no.	Name of Species	No. of organisms collected			Remarks
		High	Mid	Low	
1	Catla catla	1	2	2	
2	Labeo rohita	1	1	2	
3	P.fasciatus	13	20	12	abondant
4	P.filamentosus	20	24	27	abondant
5	Mastacem.armatus	3	-		
6	H.fossilis	2	1	5	
7	Etroplus suratensis	6	-	2	
8	Wallago attu	1	-	1	
9	Mystus cavasius	7	2	2	
10	Tilapia	7	3	3	
11	Barilius gatensis	6	13	7	normal
12	Hyporhampus limbatus	2	-		
13	Ambly.microlepis	46	34	33	abondant
14	Rasbora daniconius	8	10	-	
15	Garra mullya	-	6	2	
16	Clarius dussumieri	-	1	4	
17	Channa striatus	-	1	-	
18	Param. thomassi	-	2	-	
19	Anguilla	-	2	2	
20	Mrighal	-	-	1	

Fourteen species were caught from high land, fifteen species were collected from the mid land and fourteen were collected from the low land of Kalpathypuzha.

Results:

Bhawania australis was collected only from the high land of Gayathripuzha. Mastacembelus armatus and Hyporhampus limbatus were collected only from the high land of Kalpathypuzha. Wallago attu, Anguilla, Etroplus, Noemacheilus triangularis, H. fossilis etc were very rare in number. In the high land of Chitturpuzha were seen the migratory bird, the Gray wage tail and people told that Otter also present in that area.

Photo 1 Wallago attu and Anguilla bicolor caught by local man in Oottara of Gayathrippuzha

The purest water was present in the high land of Gayathripuzha and the dirtiest fouling water was present in the low land of Kalpathypuzha due to the ridiculous anthropogenic activities.

Alkalinity and hardness were high in the mid land waters of Gayathripuzha compared to the other regions of the rest of the areas studied.

Photo 2 Water quality analysis done in Oottara site of Gayathripuzha

Photo 3 Seetharkundu site of Gayathripuzha

Along with this common vegetation of the water, a large number of land and marshy land vegetations were also seen covered in the river flowing areas of all the rivers.

Photo. 4 Water plants covered river surface of Kadukkakununilampathy site of Kalpathypuzha -common scene of all the rivers studied

Kunnamkattupathy site of Chitturpuzha, Parali site of Chitturpuzha and Kadukkankunnu nilampathy site of Kalpathypuzha have check dams and Puzhappalam site of Chitturpuzha, Oottara site of Gayathripuzha, Mayannur site of Gayathrippuzha and Parali site of Kalpathyppuzha have bridges in the rivers.

The common factors shown by all regions studied were the complete vegetation, erosion, encroachment and sand mining which have changed the structure and water quantity and quality of the rivers completely. The rivers should be protected by implementing strong laws and the person who violates the rules should be strongly punished. This is the only way to protect our nature and rivers to an extent.

Photo 5 Pathetic condition of Gayathrippuzha- Oottara site

Photo 6. Parli site of Kalpathypuzha Low land

Photo 7. At Kunnamkattupathy site of Chitturpuzhapuzha Upper land

Photo 8 Puzhappalam site of Chitturpuzha Mid land

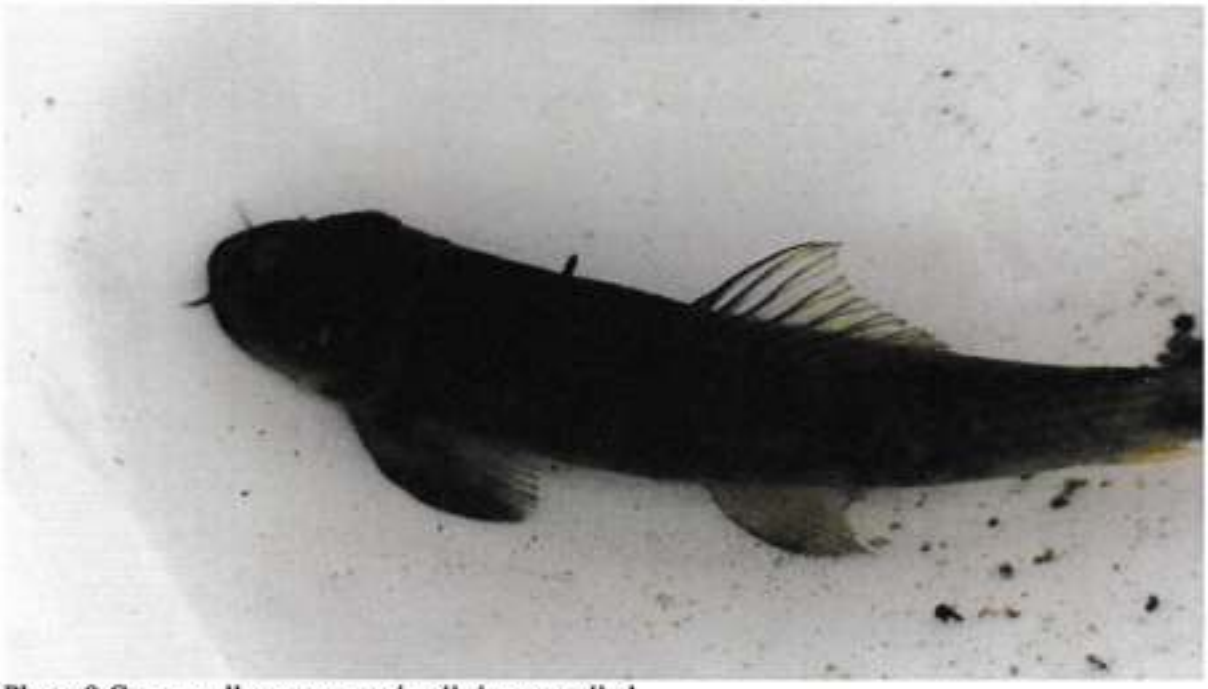

Photo 9 Garra mullya common in all rivers studied

Photo 11 Puntius fasciatus - common in all rivers studied

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