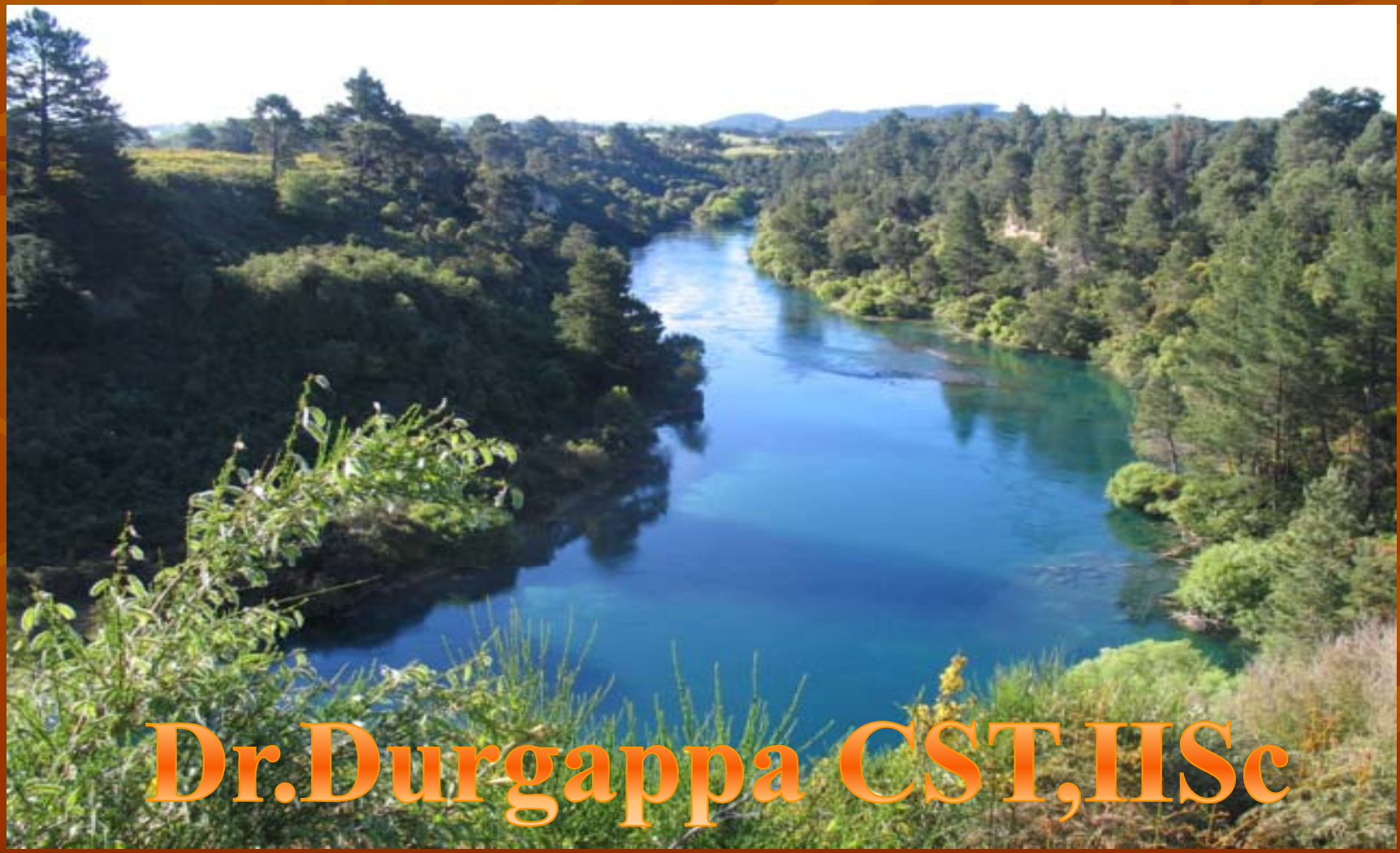
FISH SAMPLING METHODS IN URBAN WETLANDS



Introduction

- Through the ages, urban wetlands have been the lifeline of most cities in India.
- They were preserved and looked after by the people as their main source of water supply for drinking, irrigation and fish culture for their livelihood.
- But over the years, human activity steadily destroyed these wetlands and biodiversity

Introduction

- Urban lakes affected by untreated effluents from the industries and domestic sewage have deteriorated the water quality in the lake thus it is declining biodiversity of aquatic ecosystem and freshwater fishes.
- The lake gets little chance to rejuvenate itself as a run-off happens only once a year during the monsoons, whereas pollutants flow in throughout the year.

Introduction

- Fresh water fish are amongst the most nutritious of foods and vital dietary supplement.
- Therefore it is important for the poor people for subsistence fishing in streams, rivers and tanks in urban areas.

Introduction

- People in the urban areas must learn to live in harmony with nature in their own habitat.
- The wetlands flora and fauna of these areas have to be preserved for urban areas to survive and remain healthy.

Introduction

- Government is elaborating a strategy and an action plan to conserve, sustainability use and equitably share the benefits of use of its rich resources of diversity of life.

Fish Sampling Methods

- Standardized sampling is necessary to assess the various fish species in ponds, lakes, rivers, canals and streams.

- Use of standard techniques allows biologists to concentrate on the resources on improving fish diversity

Fish Sampling

- Collection made at particular time by using particular sampling tool.
- **Fish sampling is a technique of catching the fishes in selected water bodies in particular time with different gears.**

Why Fish Sampling?

- This allows the biologist to identify problem fish populations, discover populations with exceptional angling opportunities, set regulations, or apply various management strategies and monitor their effects.
- Standardized sampling methodologies are also extremely important in fisheries and are required to evaluate how a fish population changes over time, or is functioning compared to an “average” in a state or a region.
- Standardized fish sampling and data comparison methodologies are used in a wide variety of fields such as medicine, finance, education and agriculture.

Procedures

Recommended standard field procedures

- Site selection
- Sampling
- Sampling time
- Sampling type and number of replicates
- Sampling Techniques
- Sampling Frequency
- Sampling efficiency
- Gears
- Fish collection method from cast net
- Fish collection methods from ponds, rivers, lakes and canals
- Fish sorting and processing
- Fish handling
- Fish species identification
- Field record keeping
- Fish preservation techniques
- Field preservation
- Fish diversity and production
- Advantages of fish in the water
- Biological Indicators of Aquatic Ecosystem Stress

Sampling time

- This is very important aspect for best fishing results.
- Morning 6.00 to 18.00 hours and 20.00 to 06.00 hours.
- The nets, are generally set up at night, so that catch can be gathered early in the morning; twilight and sun rising are the ideal moments for good catch

Sampling type and number of replicates

- Sampling types depends on using different kinds of gears at what depth in different water body sources and how many times net casting in same place for recording replicates.

Sampling Techniques

- Standardized sampling is necessary to assess the various fish species in wetlands.
- Use of standard techniques allows crew to concentrate on the resources on improving fish diversity
- Organization of the fishing crew will have a profound impact on sampling efficiency.
- Understanding of the principles involved, and practice of the appropriate techniques will improve fishing results
- Also, limiting the number of crew members to 2 or 3 improves communication and efficiency, makes organization easier

Sampling Frequency

- Sampling frequency in standing water bodies once in a fifteen days
- Sampling frequency in running water bodies once in seven days

Sampling efficiency

- The depth of the water influences sampling efficiency of the various gear types.
- Sampling should occur when streams, Canals Rivers are near base-flow because flood events can have a profound effect on fish community structure and sampling efficiency.
- For wadeable streams, canals, rivers and ponds, fish sampling should be conducted before the physical habitat assessment so as not to disturb the fish community prior to sampling

Materials

- *Nets* – for collection of fish;
- *Rubber gloves* – for safety during fishing;
- *Holding tank* – for holding fish during fishing; of sufficient size to minimize stress
- *Wet containers* – for holding fish during processing; of sufficient size and number to minimize stress
- *Balance or spring scales* – for weighing fish
- *Measuring board* – for measuring total length of fish
- *Waders* – for safety during fishing

- *Polarized sunglasses* – for aid in capturing fish
- *Permanent marker* – for labeling voucher bottle
- *Taxonomic key* – to assist in identifying fish
- *Voucher bottle* – for storing preserved specimens
- *Formalin* – for preserving voucher specimens
- *Labels* – to label voucher jars
- *Camera* – to document fish species collected that are too large to preserve

Nets or Gears

Gear Types: There are two types of gears

Active Gear

- Active gear includes those that are moved through the water either by machine or with human power include seine nets, trawl nets, dip nets, hook and line (angling).

Passive Gear

- Passive gear is usually set and left stationary for a period of time, includes gill and enmeshing nets and minnow traps

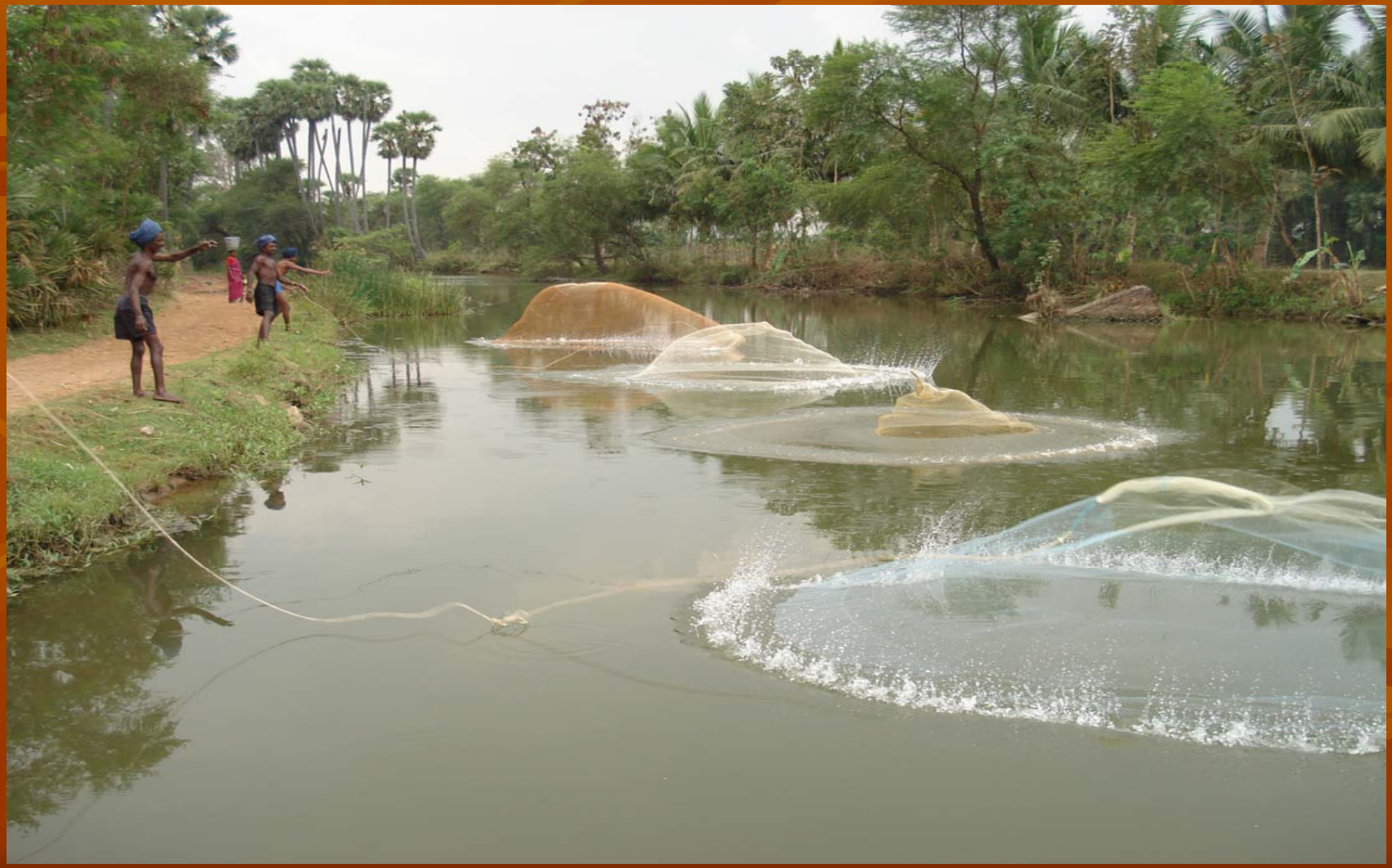
Lethal and non-lethal gear type.

Lethal Gears	**Non lethal Gears**
Angling	
Beach/purse	
/pole seines	Enmeshing/Trammel
Electro fishing	Trawl nets
Gill nets or trammel nets	Cast net
Traps	
Trawl net, fyke net	

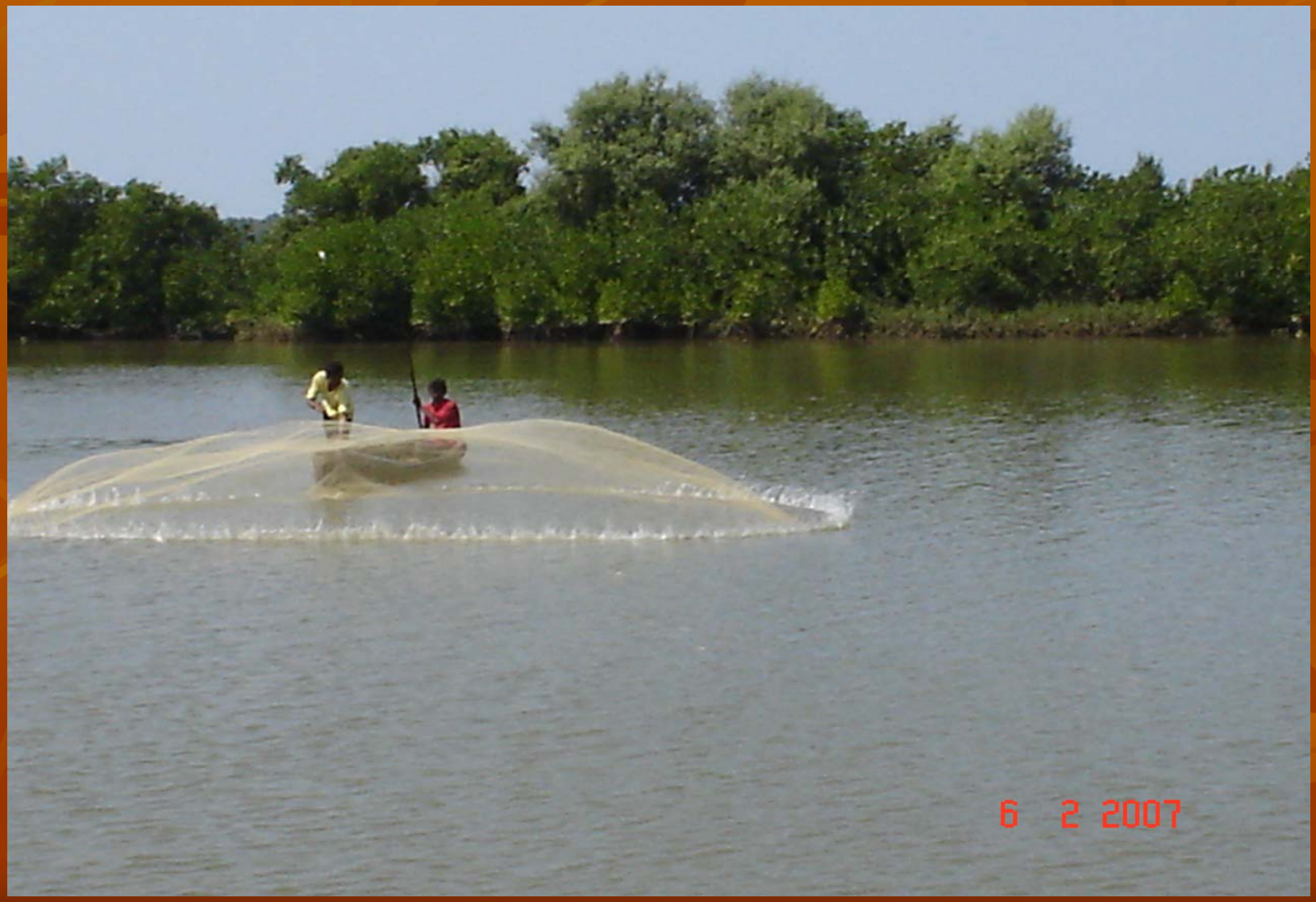
Using Boats

Cast Net

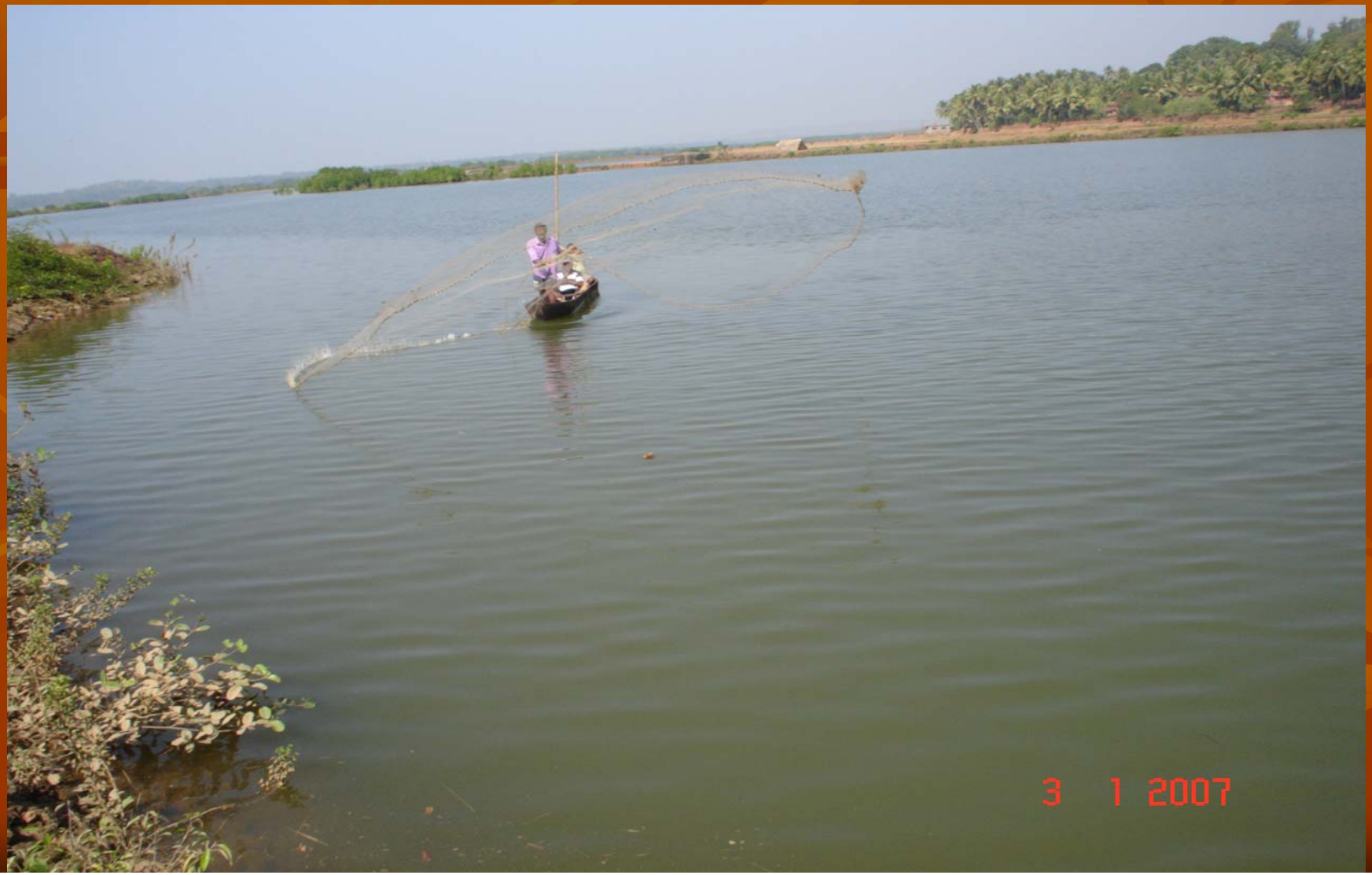
Cast Net



Cast Net



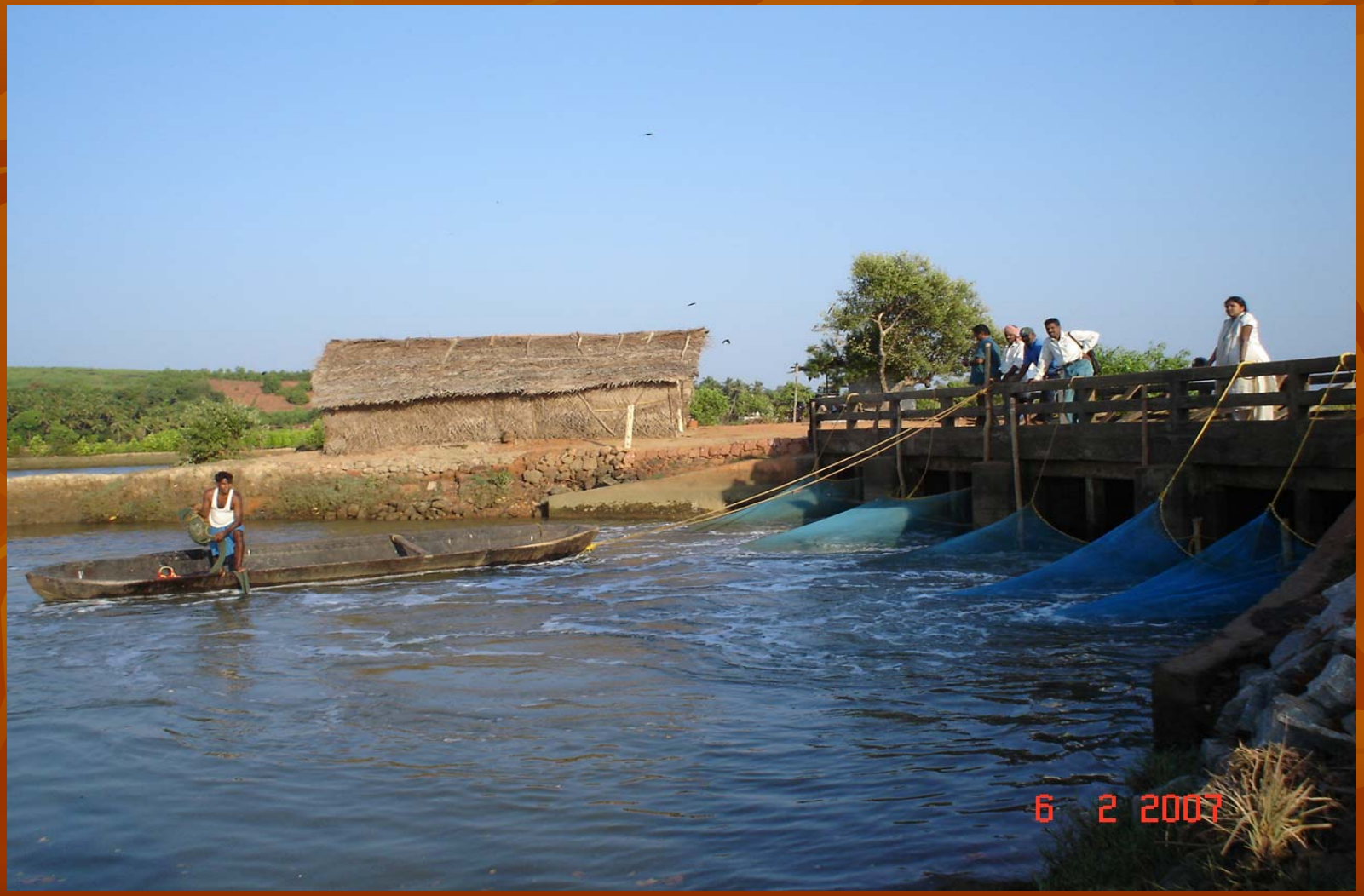
Cast Net



Cast Net

Cast Net

Fyke Net

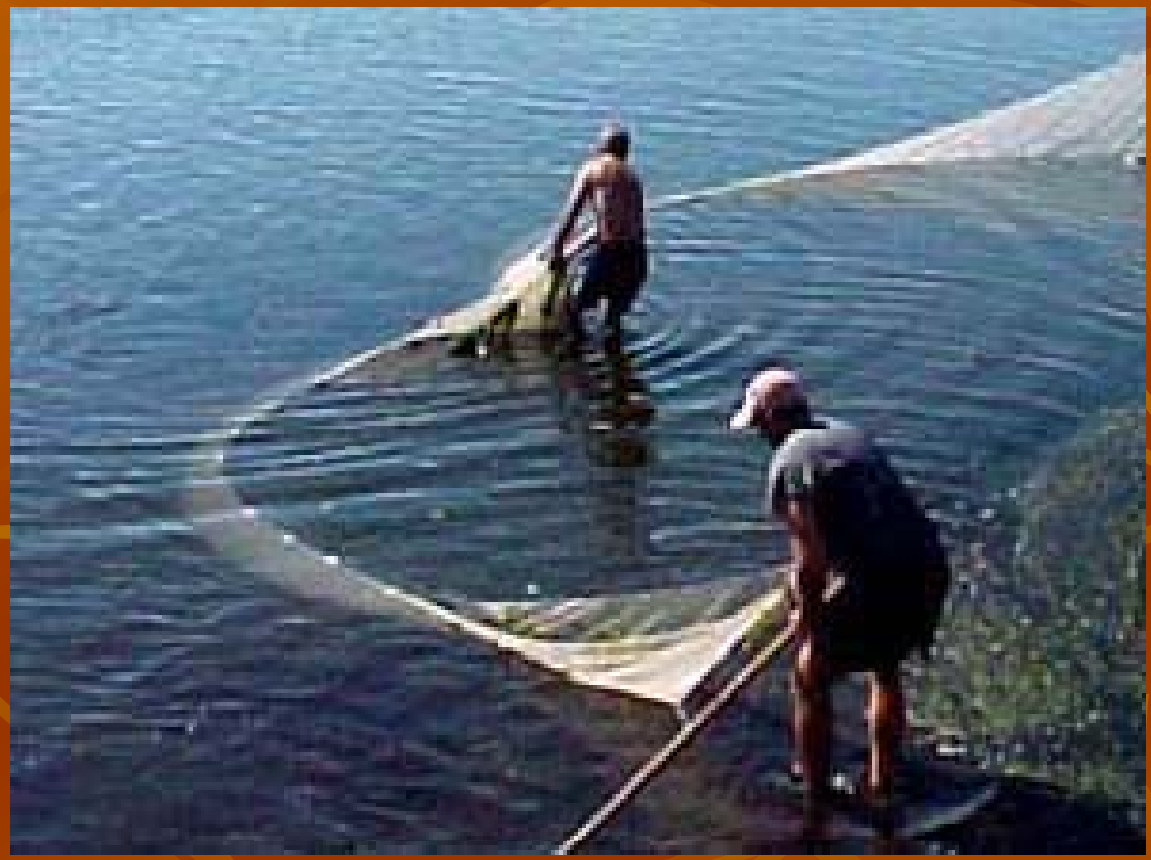


Fyke net

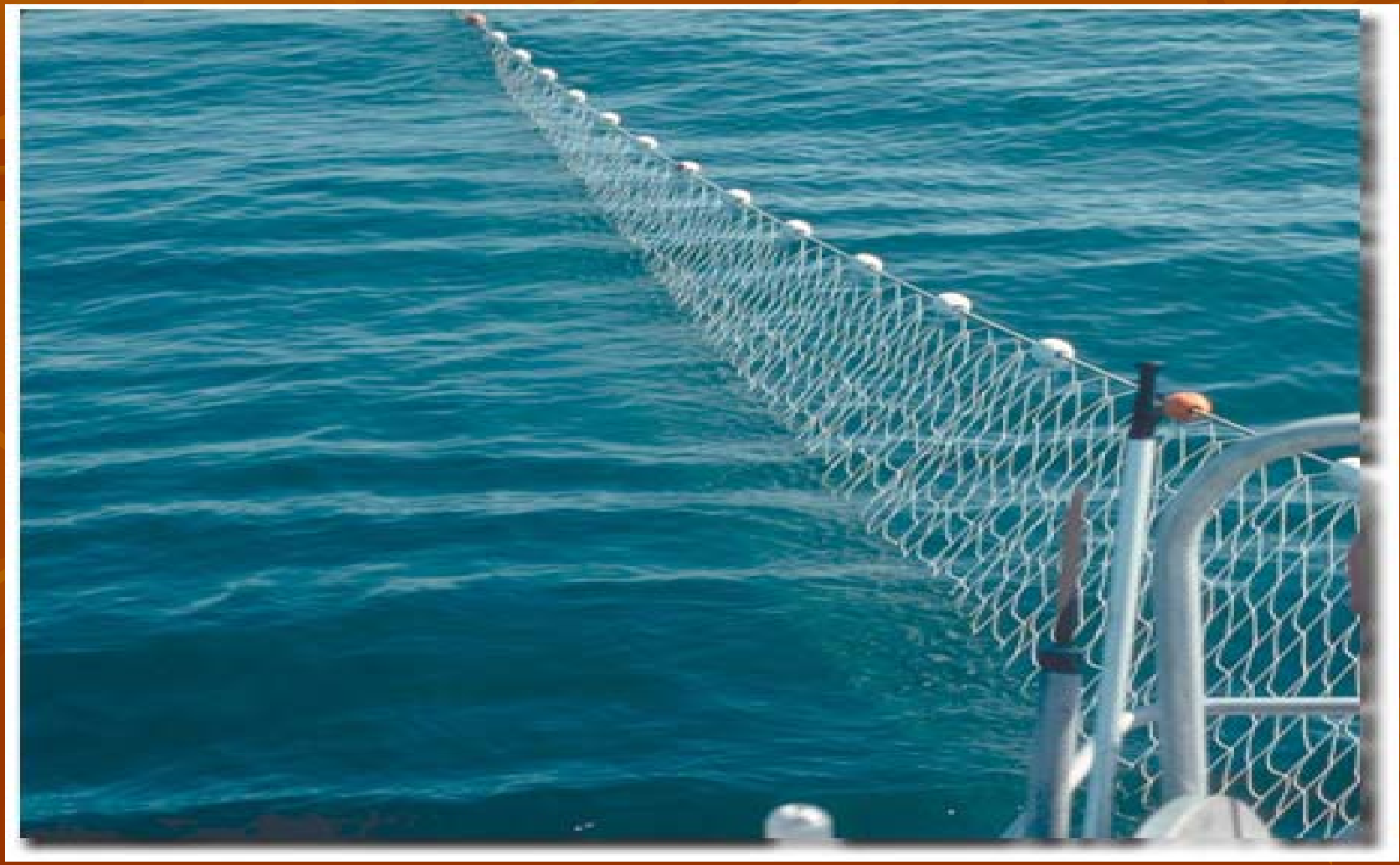
Gill Net

Gill Net

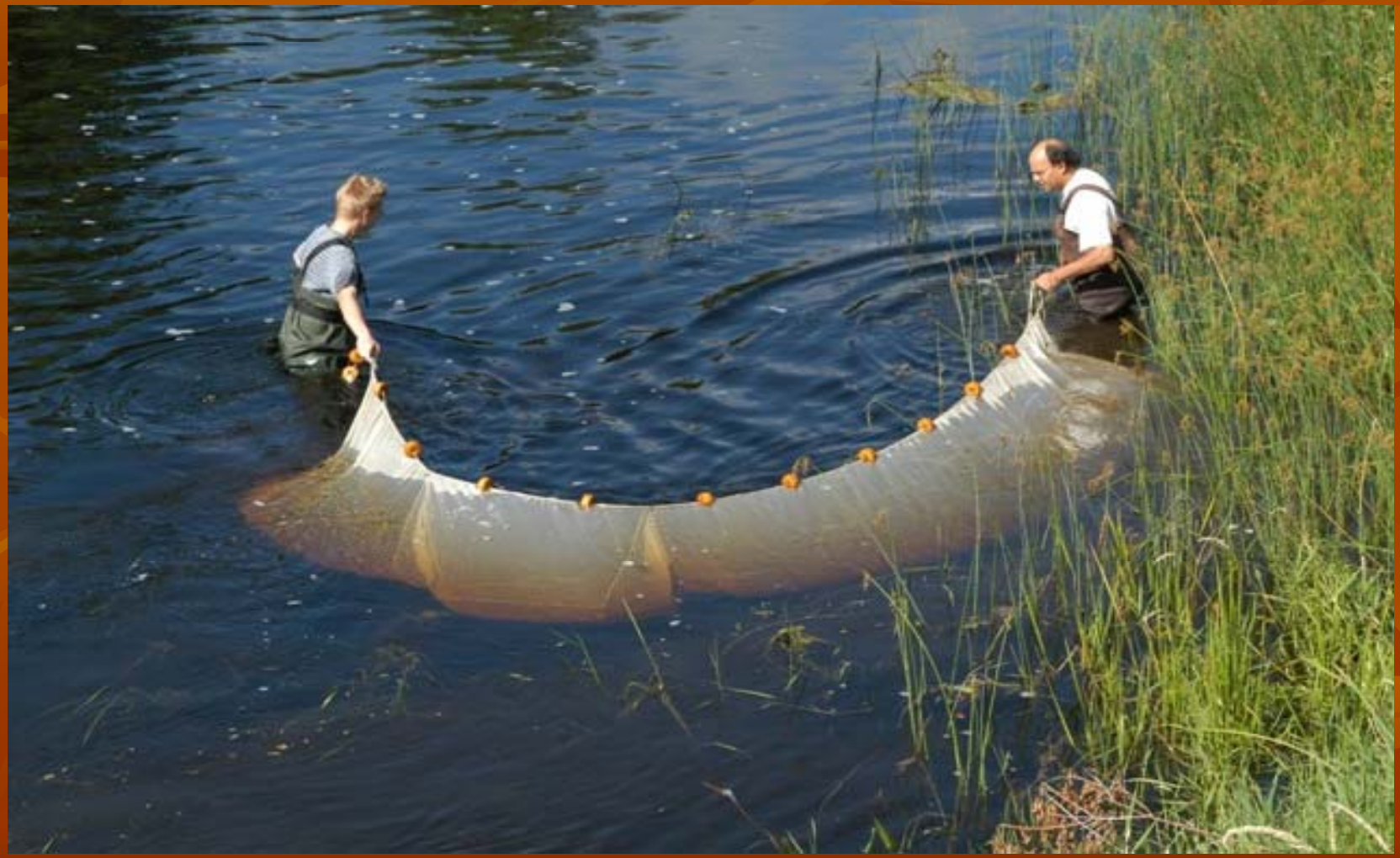
Seine net



Gill Net



Seine Net



Fish collection methods in Lakes from Cast net

- Select water body
- Select the minimum 5-7 sampling sites in pond 1) Right Bank 2) Left bank and 3) Deep water 4) Back water 5) inflow point

(In canal 1. Base flow 2. Mid flow and 3. End flow for every 200 Meters)

- Select the cast net
- Cast nets are circular nylon nets with weight tied around their edges
- Cast net are cast into water falls into the bottom in a circular trap which capture all fishes, which are, get trapped inside it and retrieve the net
- Collect the fish from net and sort out
- Identify the fish species
- Weigh the each fish species
- Record in the data in the format

Fish Sorting and processing

- Collected fishes from net are placed in water-contained bucket with the help of dip nets or stop nets.
- Quickly fishes are sorted out on their sizes and species wise into wet containers.
- Fishes are identified to species level.
- All fish that are alive after processing should be immediately returned to the water, unless they are needed as voucher (preserving) specimens.

Fish species identification

- Fish morphology is a good starting place for identification. To appreciate, as well as to understand the diversity of fresh water fish, it is important to first be able to identify features that are common to most fish.
- When covering fish morphology include: (1) body forms of fish (2) fin function, location, and types- dorsal, caudal, anal, pelvic, pectoral (3) the operculum, nostril, gills, eyes, and lateral line (4) mouth shape, size, and location.

Identification

- Un identified fish are preserved in 4% formalin in voucher bottle and are brought to the laboratory for identification

- Preserved specimens are identified to species level using the Taxonomic key

Field Sample Form

Project No.----------Site (Name and Number)----------

- Place ----------Lat/long ----------

Target Species

- Freshwater----------
- Pond----------
- River----------
- Lake ----------
- Stream----------
- Canal----------
- Proposed Sampling Date----------
- Proposed Sampling Method----------
- Seining----------
- Trawling ----------
- Mechanical grab ----------
- Biological dredge ----------
- Hand collection----------
- Others (Specify)----------

Number of sample replicates No of field replicates (1 composite sample only)

---------- Field replicates

(Specify no for each target species)

- No of individuals per composite ---------- fish per composite

Channa maurilius

Puntius sophore

Tilapia mossambica (Oreochromis mossambicus)

Salmostoma untrachi

Garrha gotla stenorhynchus

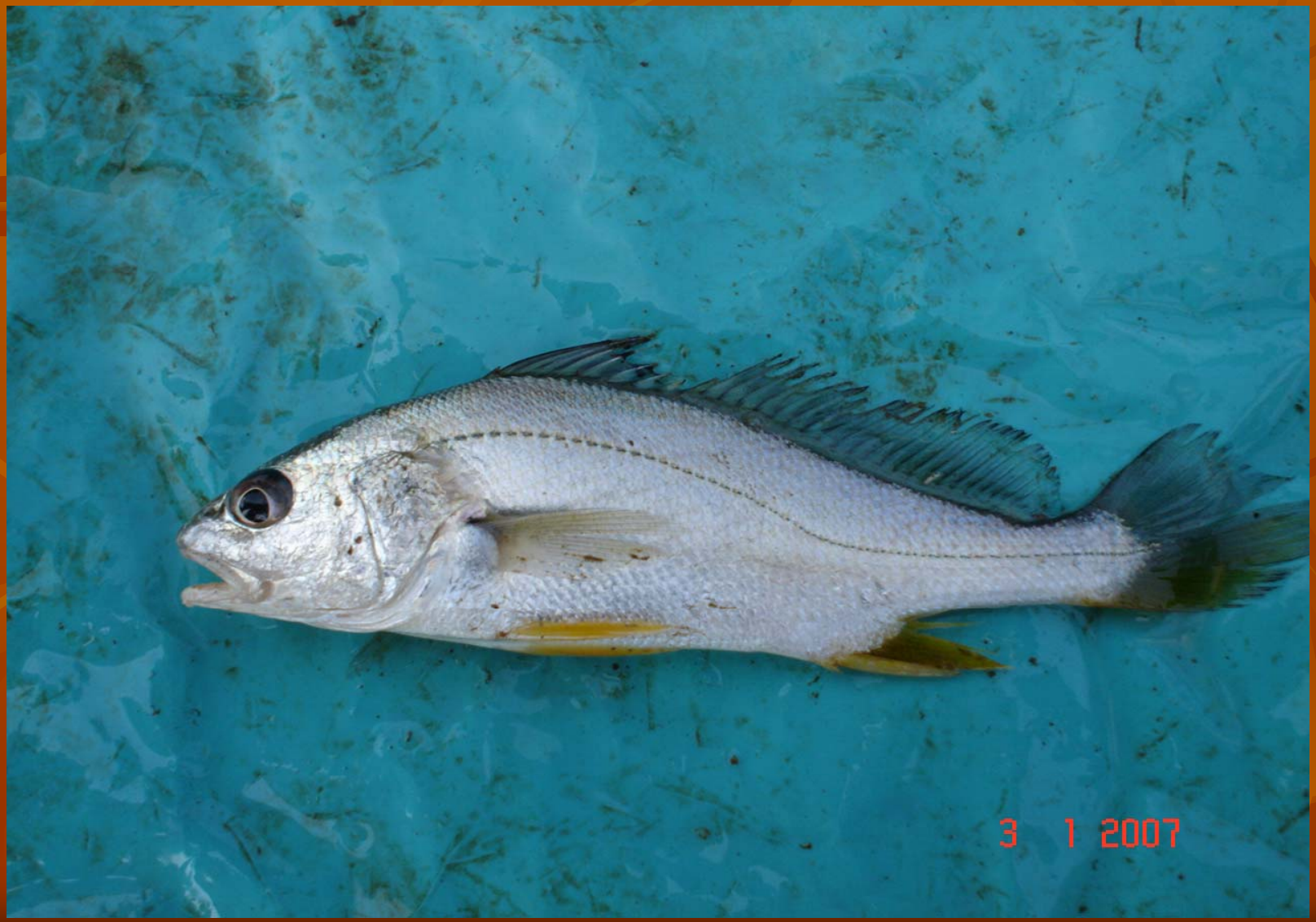
Notepterous notepterous

Longichistura bhimachari

Lutzanus russelli

Sphyraena jello

Atule mate



Etroplus maculatus

Cynoglossus bilineata

Etroplus suratensis

Labeo rohita

Catla catla

Cirrhinus mrigala

Cyprinus carpio

Rasbora daniconius

Thank You