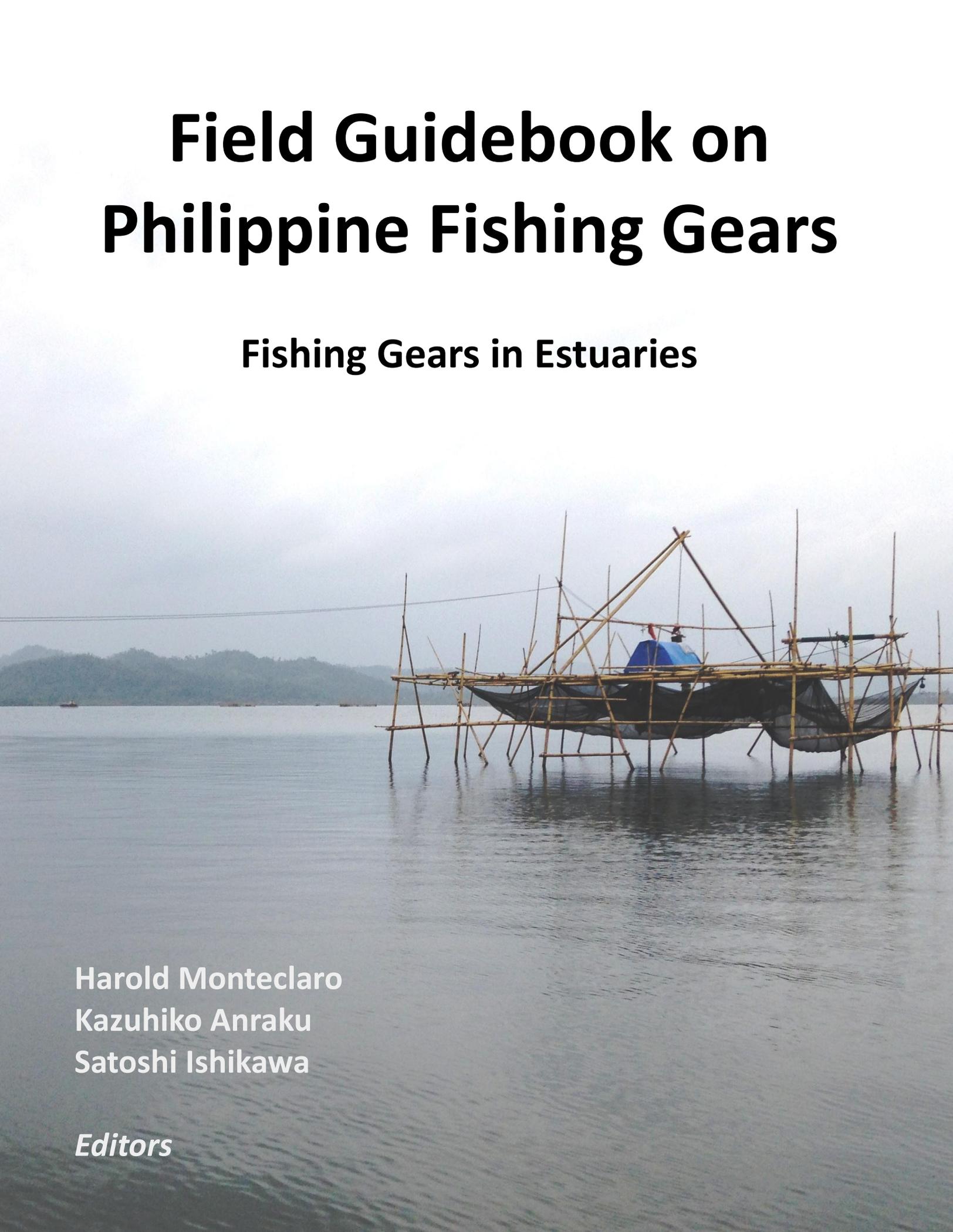


# Field Guidebook on Philippine Fishing Gears

## Fishing Gears in Estuaries



Harold Monteclaro  
Kazuhiko Anraku  
Satoshi Ishikawa

*Editors*



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### *Editors*

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Satoshi Ishikawa

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# Explanatory Notes

## Abbreviations and Symbols Used

∅	- Diameter
PA	- Polyamide
PE	- Polyethelyne
HDPE	- High Density Polyethylene

## Classifying bamboo poles

Class	Diameter at base
1st class	~ 40 cm
2nd class	- 30 to 35 cm
3rd class	- 28 to 30 cm
4th class	- 15 to 18 cm

# **Chapter 1**

# **Introduction**

*Harold Monteclaro, Kazuhiko Anraku  
and Satoshi Ishikawa*

Fisheries play a key role in providing food and livelihood in coastal communities. All over the world, fishers employ diverse methods to catch fish. The choice of a fishing method and its subsequent success and fishing efficiency are influenced by several major factors, namely the environment (e.g., fishing ground characteristics, weather, climate), biota (e.g., fish population, distribution, behaviour), and man (e.g., technology, machineries, local culture).

In a tropical country such as the Philippines, there exists a wide variety of aquatic ecosystems such as lotic and lentic environments, estuaries and wetlands, seagrass beds, mangrove forests, coral reefs, beach and tidal areas, pelagic, benthic, and oceanic environments. Each ecosystem is a unique habitat with distinct biophysical processes present in each area. Obviously, fishing gears and methods used in a particular ecosystem are quite different from those being used in another habitat. Because of the great variety of fishery resources that are being exploited in different types of habitat, we hope to document fishing activities according to the type of tropical aquatic ecosystem.

As an initial publication, this book is prepared to document the various fishing gears and methods that are being employed in a tropical estuary. An estuary is a body of water where freshwater and seawater meet and is one of the most productive ecosystems in the world. This habitat has unique plant and animal communities that include mangrove forests, seagrass beds and a variety of euryhaline species that have adapted to brackish water.

This book is a compilation of fishing gears and methods that are employed by small scale fishers in a tropical estuarine environment. In the Philippines, more than 1.6 million Filipinos depend on the fishing industry for livelihood. Of this number, about 85% belong to the municipal fisheries sector. The municipal fisheries sector is composed of fishers that conduct fishing operations either without the use of boats or with the use of boats less than 3 GT in size.

### **What are the objectives of this book?**

The overall aim of this book is to provide the reader a broad understanding of biological, ecological, economic and social aspects of fisheries science. Specifically, this book aims to document the fishing gears and methods used in an estuary, with New Washington-Batan estuaries, Aklan, Philippines as an example. By the time you have read this book we hope that you will appreciate and understand:

1. how the physical processes of an estuary influence the choice and success of fishing methods,
2. how fish biology and behavior affect fishing gear efficiency, and
3. how to conduct field work related to capture fisheries.

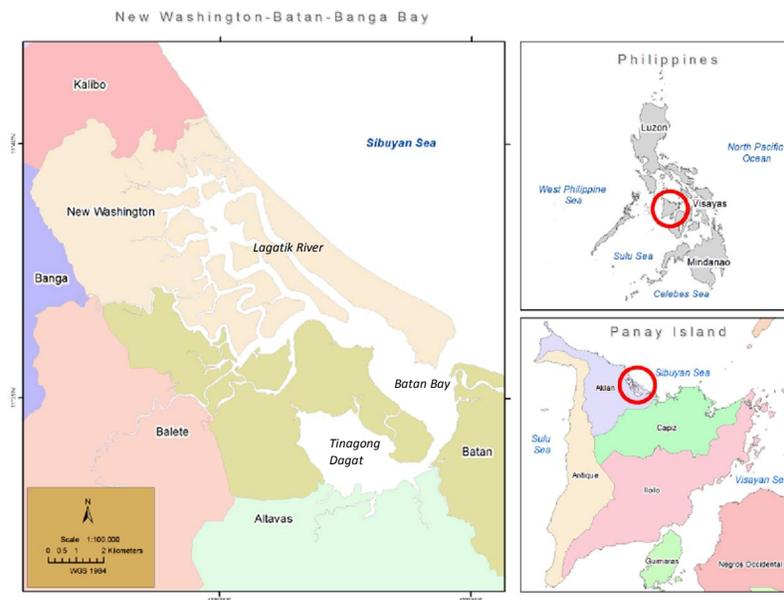
### **Why is this work significant?**

This book identifies fishing gears and methods specific to a particular aquatic ecosystem. It provides information on the possible ecological and social implications of their use. Through this work, we hope to contribute in the dissemination of knowledge about capture fisheries and its role in fisheries management. Effective fisheries management requires clear objectives and decision-making process supported by best scientific advice. We hope that this work can assist local governments and fishery managers in instituting management strategies and measures that will ensure sustainable use of our aquatic resources.

## Overview of the New Washington-Batan estuaries

The New Washington-Batan estuary is a body of water that borders the municipalities of New Washington, Batan and Altavas, all of Aklan Province. A number of tributaries transport freshwater into the estuary while seawater enters during high tide. During low tide, water recedes into the Sibuyan Sea. The estuary is relatively shallow. The area near the estuary's mouth, sometimes called Batan Bay, is about 10-20 m deep while the Lagatik River and Tinagong Dagat are about 5 m deep. The upstream areas are often about 1-2 m deep at low tide.

A map showing the New Washington-Batan estuaries. These estuaries are located in northern Panay Island, western central Philippines.



The estuary is fringed by mangrove trees. Typical mangrove trees include *Rhizophora*, *Avicennia* and *Sonneratia* species. *Nypa* are also found in the inner sections especially along river banks.

In some areas of the estuary, seagrass beds are present although sedimentation is a serious threat for these estuarine habitats.

The fisheries in the New Washington-Batan estuaries



The estuary supports aquaculture activities such as A) fishpond culture of shrimps and milkfish, B-C) oyster and mussel culture, and D) fish cage culture.

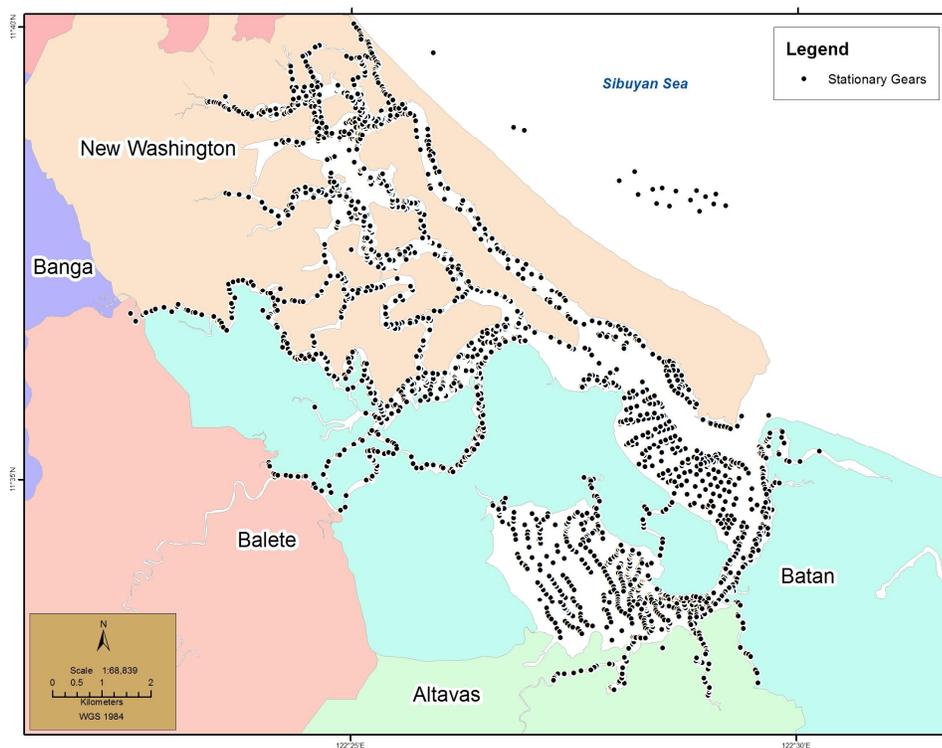
Fishpond picture by IA-CFOS, UP Visayas.



A common sight in the estuary. A stationary fishing gear operator may own fish cages where he cultures grouper, snapper or other species. After hauling catch from the fishing gear, the expensive fish and invertebrates are sold to fish brokers while the small and juvenile ones, often with low commercial value, are used to feed the cultured fish.

Like many estuarine areas in the country, the primary fisheries are the shrimps, crabs and mullets. Other fishery resources are sergestid shrimps, rabbitfishes, gobies, groupers and snappers. Local fishers employ several fishing methods to exploit these fishery resources although only municipal fishing gears are allowed to operate because the estuary is considered as a municipal fishing ground.

The fishing gears in the estuary are best classified as stationary or non-stationary. Stationary fishing gears include the shrimp traps, tidal traps, fish corrals, filter nets, lift nets and barrier nets. Except barrier nets, all other stationary fishing gears are primarily made of bamboo and netting. The bamboo poles that serve as framework of these stationary gears are staked into the muddy or sandy substrate making these gears fixed in place.



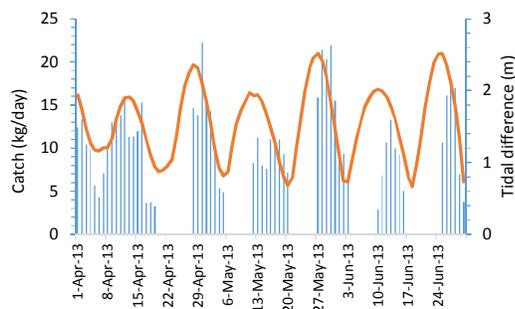
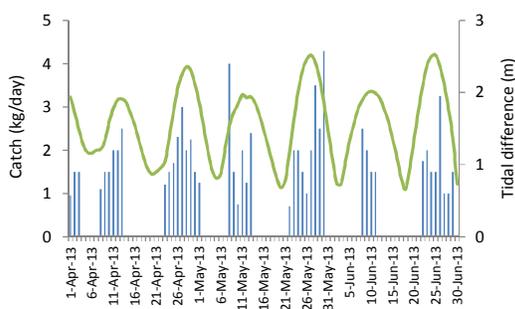
The presence of a large number of stationary fishing gears in the New Washington-Batan estuaries is remarkable. Dots indicate position of these stationary fishing gears.



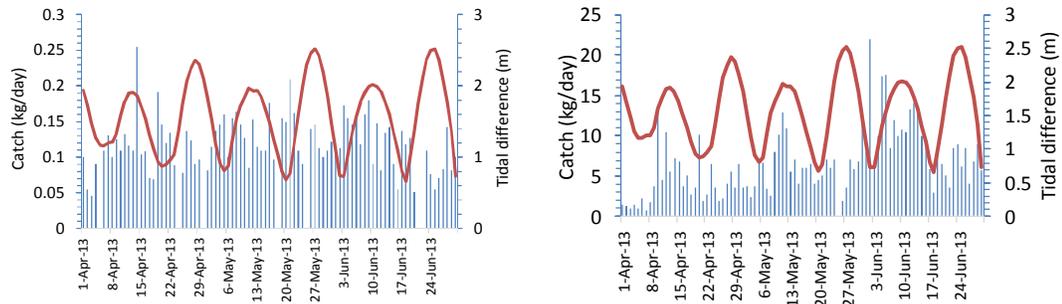
Bamboo is the primary material used in construction of stationary fishing gears. The sharpened end of the pole is pushed against the sandy or muddy bottom and buried about 1 m deep so that it can serve as a pillar or post. The other primary construction material is the netting.

The stationary fishing gears are mainly passive gears. These gears are generally fixed in place and rely on the target species to approach the capture device. In contrast, active fishing gears are designed to chase and capture target species.

In the estuary, the success of a fishing operation is mainly influenced by tides. As tides rise and fall, they create flood and ebb currents. Stationary fishing gears in the estuary are designed so that the rich supply of fish and other invertebrates carried by these currents are guided into capture chambers.



The graphs above show the catch per unit effort (CPUE) of fish corral (left) and filter net (right) that were operating in the New Washington-Batan estuaries. Whenever there was a strong tidal current, i.e., there was a high tidal difference between high and low tides (indicated by lines), the CPUE increased (indicated by bars). During days when there was minimal water movement (locally called *aya-ay*) or low tidal difference, CPUE decreased or fishing operation was suspended.



However, not all gears in the estuary are influenced by tides as shown by the CPUE of crab pots (left) and lift net (right). Pots are passive fishing gears while lift net operators use light to lure fish towards the submerged net.



In the study area, shrimps and crabs are sold to local buyers who act as middlemen (left). Right photo shows fish market in New Washington, Aklan.

### Limitations

This study was conducted from 2013 to 2014. While we did try to document all the fishing methods in the study area, we may have missed to document one or several fishing operations. All other fishing methods that are no longer practiced in the study area may not have been included in this book.

We hope you enjoy reading this book and find it useful.

# **Chapter 2**

# **Stationary Fishing**

# **Gears**

*Harold Monteclaro, Ruby Napata,  
Liberty Espectato, Gerald Qunitio and  
Alan Dino Moscoso*

# SHRIMP TRAP

Local Name: *Tigbacoe*

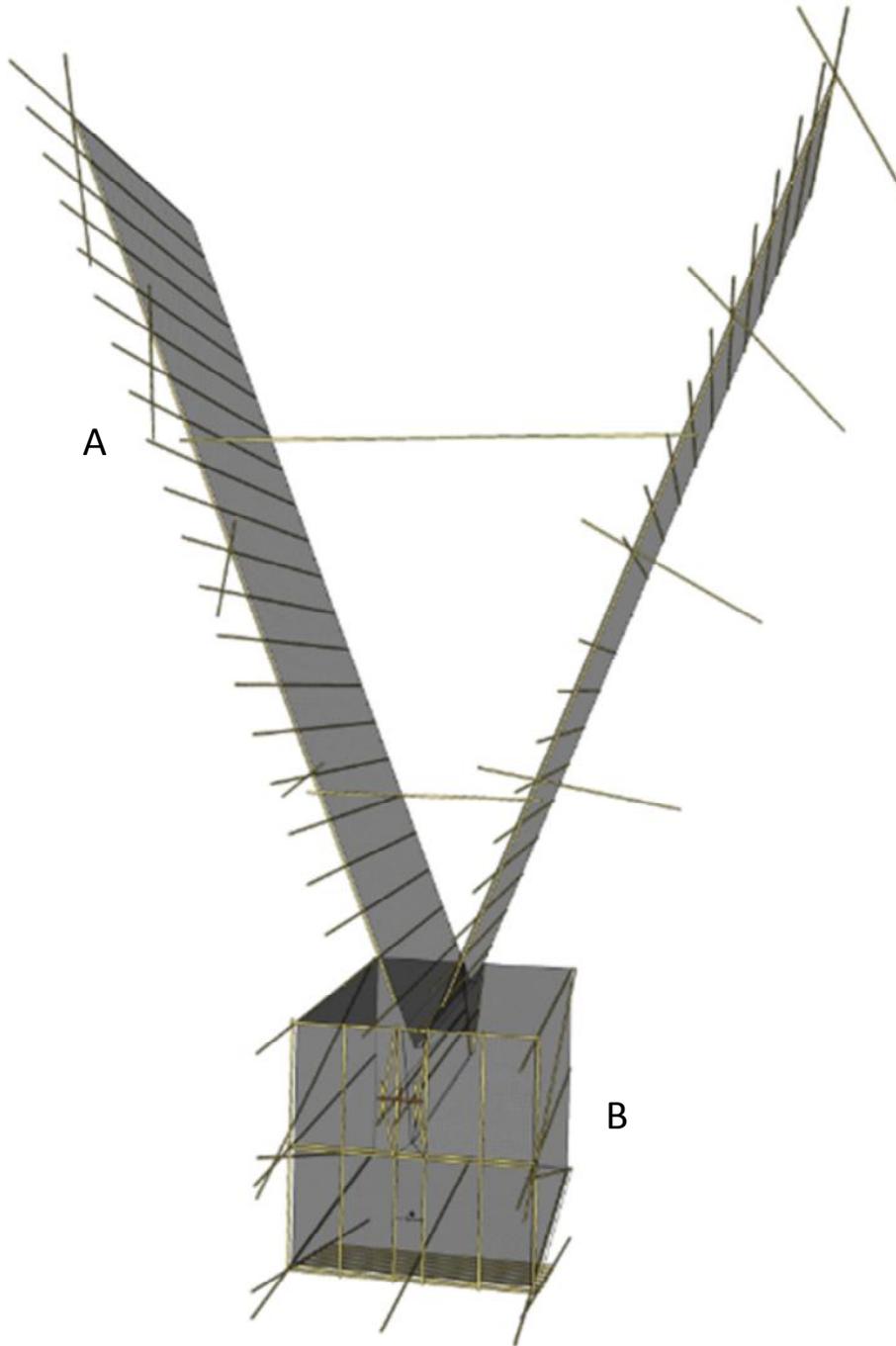


## At a glance

1. A *tigbacoe* is a stationary gear operated in shallow waters and is primarily made of bamboo and netting.
2. Its main parts are the wings and codend. At the codend area, a light source is suspended above seawater presumably to lure target species such as shrimps.
3. Fishing operation is usually conducted by a single person and typically starts late afternoon when the fisher goes to his unit and lights the kerosene lamp. The fisher then goes home and returns to the *tigbacoe* before sunrise to haul the codend and retrieve catch.
4. A *tigbacoe* could be operated all throughout the year. Peak season is from September to January.
5. Construction costs range from 8,000-10,000 pesos and the gear could be functional for more than 10 years provided proper maintenance is performed.

## GEAR DESCRIPTION

### Parts of a *Tigbaco*



A - Wing

B - Codend

## GEAR DESCRIPTION

### Parts of a *Tigbaco*

Wings ( <i>Taktakon</i> )	
<b>Function</b>	<b>Materials Used</b>
The wings herd the fish towards the cod-end.	Bamboo Type: Small bamboo poles Number: 50-60 pcs Netting panel - PE Raschel net, knotless, No. 12-13 mesh size

#### **Description**

A *taktakon* is a paired row of bamboo poles and netting. The bamboo poles are buried 1-2 m into the substrate and are spaced about 1 m from each other. Its opening width is usually around 12-15 m, length is 18-25 m and height is 3-4 m.



The pair of wings of a *tigbaco* is constructed so that its opening faces the ebb current. Fish and other organisms carried by the tidal current are guided towards the codend.

## GEAR DESCRIPTION

### Parts of a *Tigbaco*

Codend ( <i>Bunu-an</i> )	
<b>Function</b>	<b>Materials Used</b>
The codend is the area where trapped fish are retrieved.	Netting panel: Raschel PE, knotless Mesh size: No. 17-18 Frame and platform: Bamboo Twine for tying: PE and PA

#### **Description**

The codend is constructed using bamboo and netting. Each side of the codend is about 0.57 to 0.64 m long. The shape of the codend is usually square, although it may also be rectangular or round.

The codend is constructed next to the wings. The terminal end of the *taktakon* leaves a small opening, about 0.3-0.5 m. Atop the codend, a platform made of bamboo is constructed to allow fisher to perform fishing operation.



The codend connects to the end of the wings. The picture above shows the small area that serves as opening to the codend (raised).

## GEAR DESCRIPTION

### Parts of a *Tigbacoe*

Light Source	
<b>Function</b>	<b>Materials Used</b>
Fishers believe that light lures shrimps and fish into the codend.	1 unit kerosene lamp ( <i>kinki</i> ) Other varieties: Petromax (pressurized kerosene lamp) Electric bulb

#### **Description**

The lighted kerosene lamp is lowered from the platform until about 1 m from the expected water surface during high tide. The fisherman lights the lamp around 5:00 PM and is extinguished the next morning before the codend is hauled.



The codend is the part of the *tigbacoe* where trapped fish is retrieved. A kerosene lamp (encircled) is lowered from the platform lure fish. Setting and hauling of the codend is performed above the bamboo platform.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	Sep to Jan	<b>Months:</b>	May to Aug
<b>Ave. catch per day:</b>	4-6 kg	<b>Ave. catch per day:</b>	2-3 kg
<b>No. of fishing days:</b>	23-28 days/month	<b>No. of fishing days:</b>	14-19 days/month

### Dominant Species Caught



Penaeidae  
Greasyback shrimp  
Local name: *Batod*



Portunidae  
Blue swimming crab  
Local name: *Kasag*



Portunidae  
Crenate crab  
Local name: *Kaeantugas*



Gobiidae  
Gobies  
Local name: *Tanga, Bagtis, Uling-uling*



Portunidae  
Indo-Pacific swimming crab  
Local name: *Kaeantugas*

### Examples of Other Species Caught



Mugilidae  
Mullets  
Local name: *Gusaw*



Leiognathidae  
Slipmouths  
Local name: *Aputoe*



Portunidae  
Mud crab  
Local name: *Alimango*



Anguillidae  
Eels  
Local name: *Pueoy*



Siganidae  
Rabbitfishes  
Local name: *Bueawis, Danggit*



Squillaidae  
Mantis shrimp  
Local name: *Pitik-pitik*



Penaeidae  
Tiger shrimp  
Local name: *Sugpo*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 8,000 – 10,000 pesos</p> <p><b>Who constructs gear?</b> Usually by fisher himself; may hire laborers</p> <p><b>Number of days spent on construction</b> 5-7 days</p> <p><b>Frequency and type of maintenance</b> At least once a month Net mending</p> <p><b>Number of days spent on maintenance</b> 1 - 3 days</p>	<p><b>Number of fishers:</b> Usually one person</p> <p><b>Boat used:</b> Usually non-motorized boats Some use motorized boats A few others use bamboo rafts</p> <p><b>Time lamp is lighted</b> Usually 4:00 PM – 5:00 PM</p> <p><b>Time codend is hauled</b> 4:00 AM – 5:00 AM</p>

### DESCRIPTION OF FISHING OPERATION

A *tigbaco*e is a passive fishing gear. At around 4:00-5:00 PM, the *tigbaco*e operator travels to his fishing gear aboard a non-motorized boat. Once he arrives at the fishing gear, he lights the kerosene lamp in the codend area. The lamp is suspended above the water line. Once done, the fisher returns home. He returns to the unit before sunrise, around 4:00-5:00 AM, to haul the codend. After catch is retrieved, the codend is again set until the next hauling.

When low tide occurs at night time and catch is plenty, the *tigbaco*e fisher may retrieve catch during low tide. He then returns early in the morning to check for additional catch.

# TIDAL TRAP

## Local Name: *Taba*

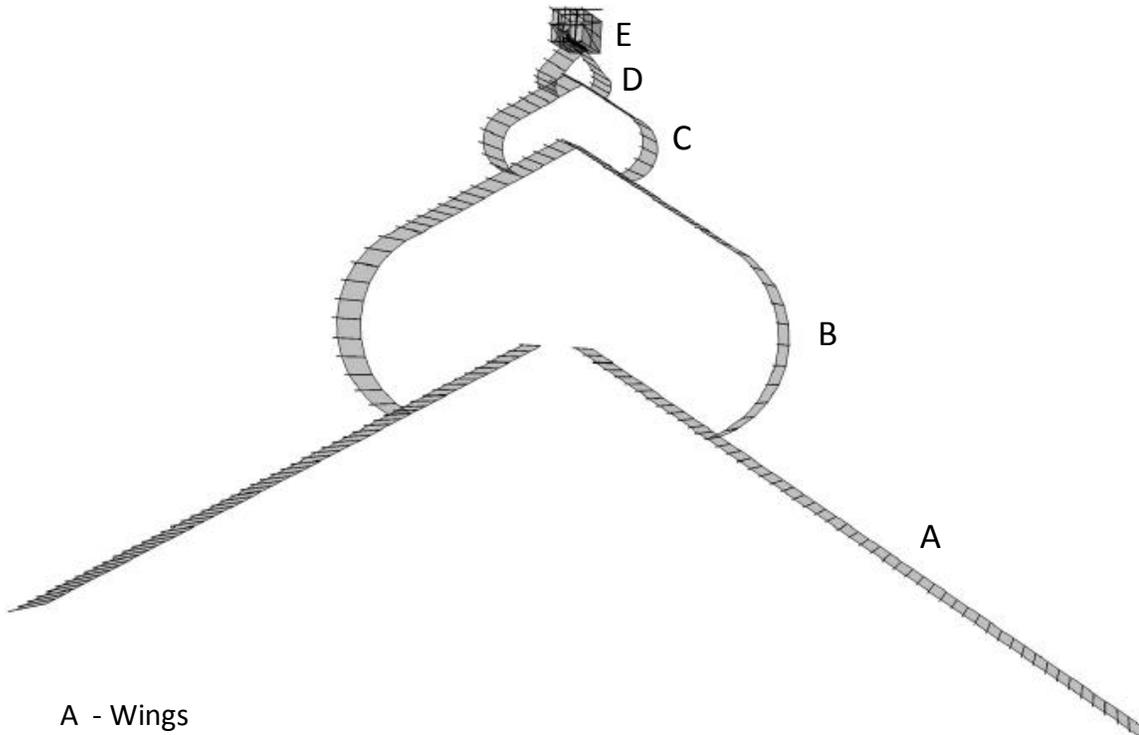


### At a glance

1. A *taba* is a passive fishing gear used mainly to trap shrimps and fishes.
2. Fish and shrimps are guided by the wings into the playground and eventually into the codend where they are collected.
3. Fishing operation is dependent on the tidal cycle. The codend is hauled about 1 hour before low tide.
4. In most cases, only one person performs the fishing operation. Most of the *taba* fishers use non-motorized boats.
5. The *taba* is operated all year round. Peak season is from September to February.
6. The cost of constructing a *taba* is about 20,000 to 30,000 pesos depending on the size of the unit.
7. A *taba* could be functional up to more than 10 years if properly maintained and is not completely damaged by a typhoon. Maintenance includes repair and cleaning.

## GEAR DESCRIPTION

### Parts of a *Taba*



- A - Wings
- B - Playground
- C - Second Chamber
- D - Third Chamber
- E - Codend

#### **Wings (*Taktakon*)**

##### ***Function***

The wing opening faces the water current during ebb tide. This allows the wings to guide the fish towards the playground.

##### ***Materials Used***

Bamboo, medium- to large-sized poles  
PE Raschel net, knotless, No. 12-13 mesh size

##### ***Description***

The wings are made of bamboo poles and netting. The bamboo poles are buried 1-2 m into the substrate and are spaced about 1 m from each other. Its opening width is usually around 80 m and length of each side of the wing is about 100 m.

## GEAR DESCRIPTION

### Parts of a *Taba*

#### Playground (*Tambahan*)

<i>Function</i>	<i>Materials Used</i>
The playground functions as a temporary holding area of fish after being led by the wings.	Bamboo, medium- to large-sized poles PE Raschel net, knotless, No. 12-13 mesh size

#### *Description*

The playground has a 4-m opening at the end of the *taktakon*. This section is heart-shaped and is about 20 m long at the side.

#### Second Chamber (*Ligaw*)

<i>Function</i>	<i>Materials Used</i>
The inner chamber of the tidal trap reduces chances of fish escape.	Bamboo, medium- to large-sized poles PE Raschel net, knotless, No. 12-13 mesh size

#### *Description*

The *ligaw* has a small opening at the end of the *tambahan*. It has the same shape as the playground, although much smaller in scale.

#### Codend (*Bunu-an*)

<i>Function</i>	<i>Materials Used</i>
The codend is the area where trapped fish are retrieved.	Bamboo, medium- to large-sized poles PE Raschel net, knotless, No. 12-13 mesh size

#### *Description*

Each side of the codend is about 4 to 5 m long. The shape of the codend is usually square. Atop the codend, a platform made of bamboo is constructed to allow fisher to perform setting and hauling of net.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	Sep to Feb	<b>Months:</b>	March to August
<b>Ave. catch per day:</b>	5-10 kg	<b>Ave. catch per day:</b>	2-4 kg
<b>No. of fishing days:</b>	20-28 days/month	<b>No. of fishing days:</b>	10-21 days/month

### Dominant Species Caught



Penaeidae  
Various shrimps  
Local name: *Batod*,  
*Sugpo*



Siganidae  
Rabbitfishes  
Local name: *Bueawis*,  
*Mubead*



Mugilidae  
Mulletts  
Local name: *Gusaw*,  
*Balanak*



Gobiidae  
Gobies  
Local name: *Tanga*, *Bagtis*, *Uling-uling*

### Examples of Other Species Caught



Leiognathidae  
Slipmouths  
Local name: *Aputoe*, *Sapsap*, *Dalinuan*

Ambassidae  
Glassfishes  
Local name: *Bakagan*



Teraponidae  
Tigerperches  
Local name: *Buga-ong*

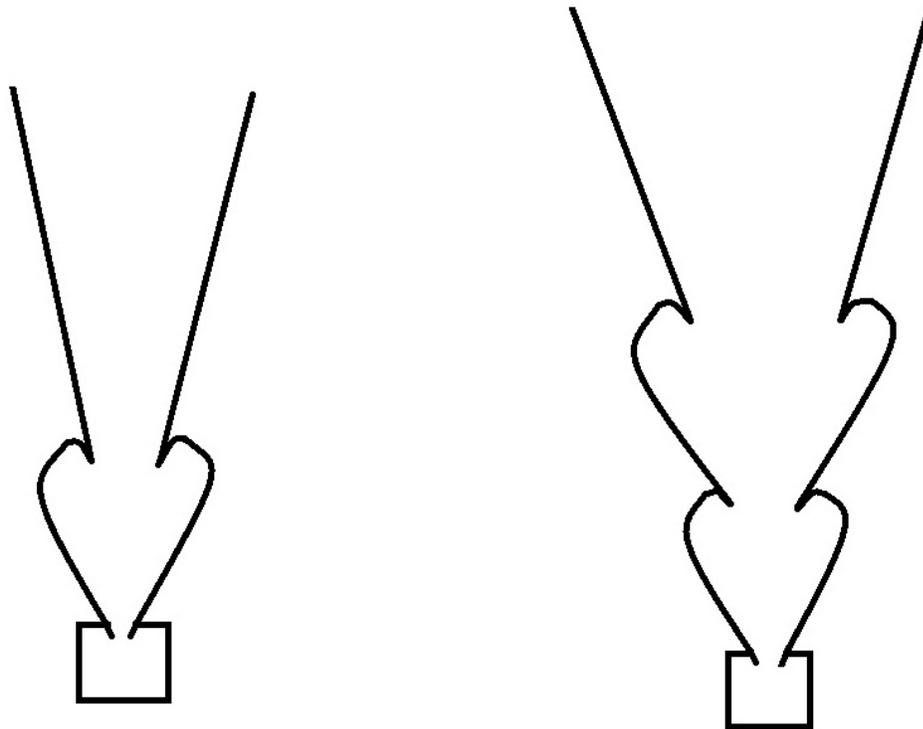
Mullidae  
Goatfishes  
Local name: *Ti-aw*

Portunidae  
Blue swimming crab  
Local name: *Kasag*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 20,000 - 30,000 pesos</p> <p><b>Who constructs?</b> Fisher aided by hired labor</p> <p><b>Number of days spent on construction</b> 14-25 days (depending on size)</p> <p><b>Frequency of maintenance</b> Once a month</p> <p><b>Number of days spent on maintenance</b> 2-3 days</p> <p><b>Type of maintenance</b> Net repair, cleaning</p> <p><b>Who performs maintenance?</b> Mostly by fisher himself</p>	<p><b>Number of fishers</b> Usually one person, sometimes two</p> <p><b>If more than 2 fishers, who helps fisher?</b> Usually the fisher's son or wife. Sorting of catch performed by fisher and his wife or other family members</p> <p><b>Boat used</b> Motorized (if gear is situated far from home) Non-motorized (if gear is located near fisher's home)</p> <p><b>Time codend is hauled</b> About an hour before low tide</p> <p><b>Time spent fishing</b> Travel to fishing ground and back: ~1 hr Hauling and setting codend: ~1 to 2 hr Sorting of catch: ~0.5 to 1 hr</p> <p><b>Fishing accessories used</b> Flashlight Scoop net</p>

## DESCRIPTION OF FISHING OPERATION



A *taba* may vary in design according to site and financial capability of the owner. (Left) A *taba* with wings (*taktakon*), first chamber (*tambahan*), and codend (*bunu-an*). (Right) A *taba* variant with *taktakon*, *tambahan*, a second chamber (*ligaw*), and *bunu-an*. Note: Illustrations not in scale.

A *taba* is a passive fishing gear that relies on water current in catching fish. The gear has a pair of wings that lead fish into the playground and eventually to the codend. The *taba* fisher hauls the codend about an hour before low tide. He performs the fishing operation on a platform that is constructed atop the codend. The codend is hauled manually. If necessary, he uses a scoop net to retrieve catch and transfer catch into a bucket. Once the catch has been retrieved, the codend is once again set to and made ready until the next low tide period.

# FISH CORRAL

Local Name: *Taba*

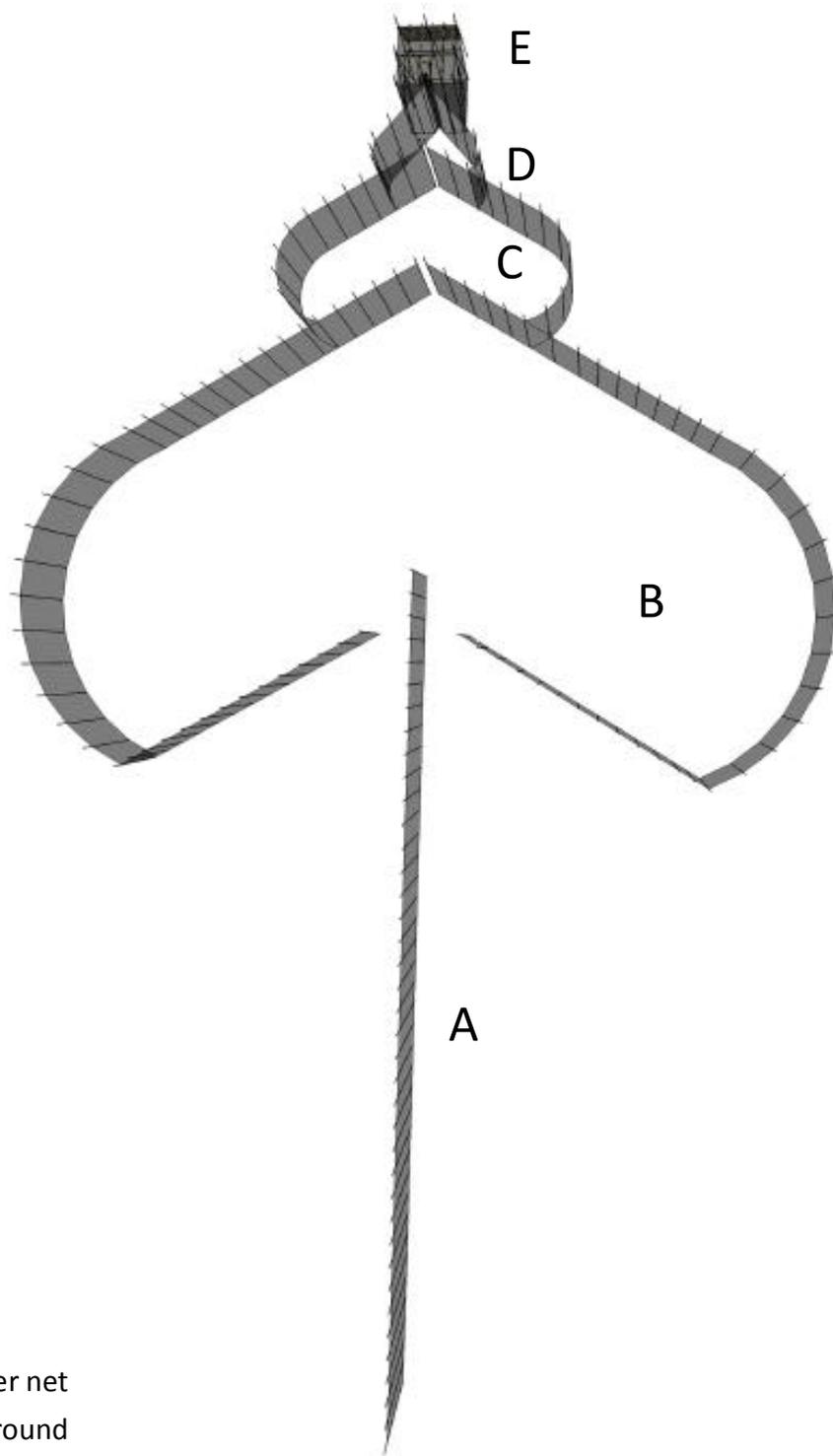


## At a glance

1. A fish corral is a stationary fishing gear that is primarily made of bamboo and netting panels.
2. It has three to five sections. Simple designs have a leader net, a playground, and a codend. Bigger versions may have two or more additional chambers.
3. Small fish corral variants are found nearshore while large variants are usually located in the deeper part of the estuary.
4. Fishing is tide dependent. A fish corral targets fish carried by tidal currents. Dominant catch includes shrimp, crabs, rabbitfishes, mullets, milkfish and other fish.
5. Because the use of the gear is tide-dependent, time of fishing operation varies according to the time of flood and/or ebb tide.
6. There is no fishing operation in days with minimal tidal fluctuations.
7. Fish corral operators use either small non-motorized or motorized boats to go to their fishing gear.

## GEAR DESCRIPTION

### Parts of a *Taba*



- A - Leader net
- B - Playground
- C & D - Second and Third chambers
- E - Codend

## GEAR DESCRIPTION

### Parts of a *Taba*

#### Leader Net (*Taktakon*)

<b>Function</b>	<b>Materials Used</b>
The leader net guides fish towards the playground.	<ol style="list-style-type: none"> <li>1. Bamboo poles: 1st class for large units 2nd &amp; 3rd class for small units</li> <li>2. Netting panel: PE Raschel, knotless, No. 8-22</li> <li>3. Headrope and Footrope: PE, 5.81 mm diameter</li> <li>4. Bamboo pegs, 40 cm long</li> </ol>

#### **Description**

The leader net is about 70-100 m long. Bamboo posts are buried about 1 m into the substrate at an interval of about 1 m. The netting is attached to the bamboo posts using PE twine (locally called *plehe*) that has a 1-mm diameter. To keep the bottom part of the net fixed in place, bamboo pegs are used to tack the lower end of the net into the substrate. The pegs are spaced about 0.5 m apart.

#### Playground/First Chamber (*Tambahan* or *Bulon*)

<b>Function</b>	<b>Materials Used</b>
The playground traps fish that have been guided by the leader net.	<ol style="list-style-type: none"> <li>1. Bamboo poles (the same as leader net)</li> <li>2. Netting panel: HDPE Raschel, knotless</li> <li>3. Headrope and footrope: PE, 5.81 mm <math>\phi</math></li> <li>4. Bamboo pegs, 40 cm long</li> </ol>

#### **Description**

The playground is constructed at the seaward side of the leader net. The materials and construction are essentially similar all throughout the gear. The playground has an area that ranges from 200 to 400 sq. m.

## GEAR DESCRIPTION

### Parts of a *Taba*

#### Second Chamber (*Palibod* or *Tambahan*) and Third Chamber (*Ligaw*)

<b>Function</b>	<b>Materials Used</b>
The second and third chambers, if present, are additional enclosures that further reduce the chance of fish escape. These chambers lead to the codend.	<ol style="list-style-type: none"> <li>1. Bamboo poles (the same as leader net)</li> <li>2. Netting panel: HDPE Raschel, knotless</li> <li>3. Headrope and footrope: PE, 5.81 mm <math>\phi</math></li> <li>4. Bamboo pegs, 40 cm long</li> </ol>

#### **Description**

The additional chambers decrease in area until the codend. The *tambahan* may require about 24-30 bamboo pieces and about 15 m netting. The *ligaw* has a smaller enclosed area and uses about 18 bamboo posts and 6 m netting.

The entrance in each chamber has a modified non-return mechanism to reduce exit of fish. The entrance to the *tambahan* is about 1 m wide. In contrast, the entrance to the *ligaw* is about 12 cm wide.

#### Codend (*Bunu-an*)

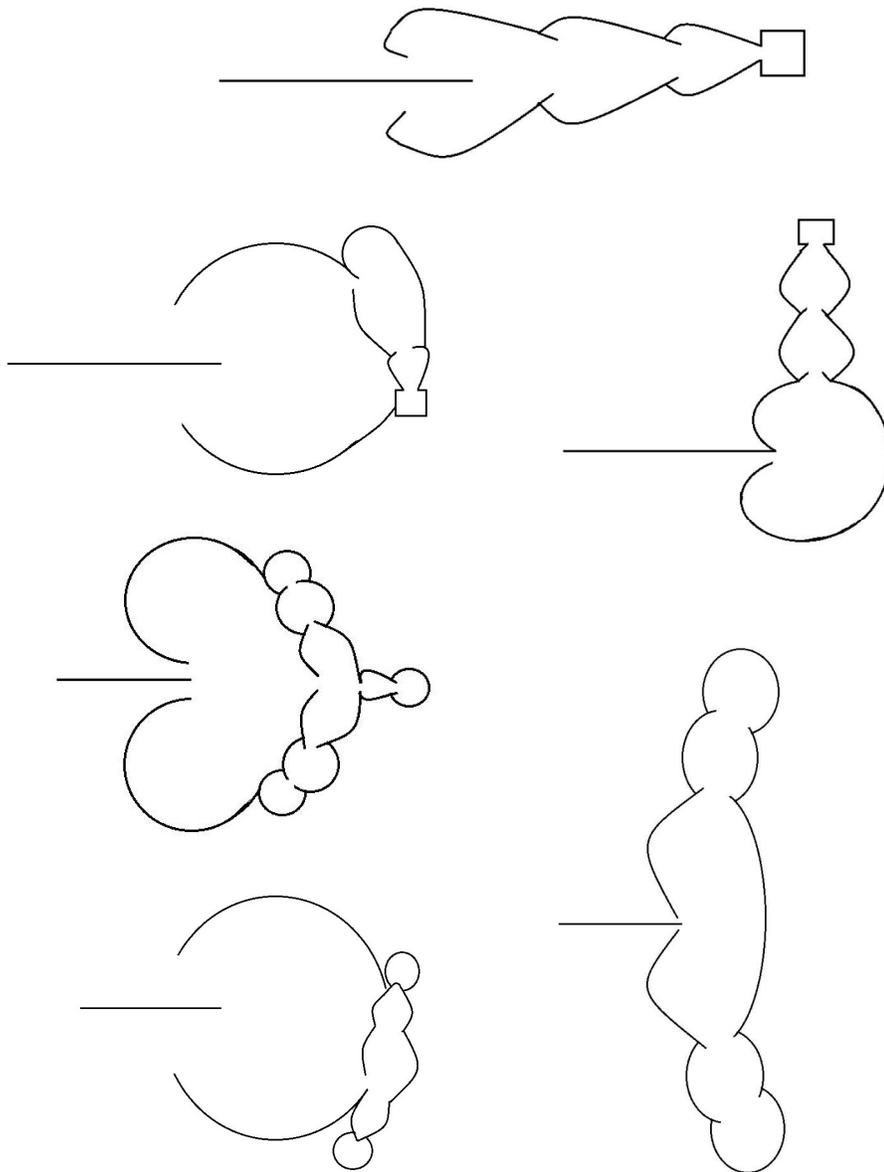
<b>Function</b>	<b>Materials Used</b>
The area where trapped fish are retrieved.	<ol style="list-style-type: none"> <li>1. Bamboo poles: 9-12 pcs</li> <li>2. Netting panel: HDPE Raschel, knotless, 2.5-3 m long</li> <li>3. Headrope and footrope: PE, 5.81 mm <math>\phi</math></li> </ol>

#### **Description**

The entrance to the codend is about 9 cm wide. Fish corrals in the estuary are tide dependent. These units may have two codends located at opposite ends of the playground. One codend is retrieved during high tide while the other is hauled during low tide. A *taba* that is constructed in deeper waters usually has a single codend, located at the deeper waters.

## GEAR DESCRIPTION

### Parts of a *Taba*



The fish corral in the New Washington-Batan estuaries vary in design based on the physical characteristic of the sites. Some designs contain only one codend. Other designs may have two codends, each with a second and third chamber that precede the codend. The two codends allow retrieval of catch during high and low tide periods. Note: Illustrations not in scale.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	Sep to Dec	<b>Months:</b>	March to August
<b>Catch per day:</b>	6-10 kg	<b>Catch per day:</b>	1-3 kg
<b>No. of fishing days:</b>	20-23 days/month	<b>No. of fishing days:</b>	13-19 days/month

### Dominant Species Caught



Penaeidae  
Shrimps  
Local name: *Batod*



Siganidae  
Rabbitfishes  
Local name: *Bueawis, Danggit, Mubead*



Chanidae  
Milkfish  
Local name: *Bangus*



Mugilidae  
Mullet  
Local name: *Gusaw, Balanak, Banak*

### Examples of Other Species Caught



Sillaginidae  
Whittings  
Local name: *Asoos*



Gerreidae  
Mojarras  
Local name: *Batwanon*



Teraponidae  
Tigerperches  
Local name: *Buga-ong*

## FISH CATCH INFORMATION

### Examples of Other Species Caught



Portunidae  
*Portunus pelagicus*  
Local name: *Kasag*



Portunidae  
*Thalamita crenata*  
Local name: *Kaeantugas*



Portunidae  
*Charybdis hellerii*  
Local name: *Kaeantugas*



Portunidae  
*Scylla* spp.  
Local name: *Alimango*



Gobiidae  
Gobies  
Local name: *Tanga*



Leiognathidae  
Slipmouths  
Local name: *Sapsap, Aputoe, Dalinuan*



Lutjanidae  
Snappers  
Local name: *Awuman*



Mullidae  
Goatfishes  
Local name: *Ti-aw*



Lethrinidae  
Emperors  
Local name: *Pasu-an*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b>                      14,000 pesos (small)                      40,000 pesos (big)</p>	<p><b>Number of fishers</b>                      Usually one person, sometimes two</p>
<p><b>Who constructs?</b>                      Fisher aided by hired labor (small)                      Usually hired labor (big)</p>	<p><b>If more than 2 fishers, who helps fisher?</b>                      Usually the fisher's son or wife. Sorting of catch performed by fisher and his wife or other family members.</p>
<p><b>Number of days spent on construction</b>                      15-30 days</p>	<p><b>Boat used</b>                      Motorized (if gear is situated far from home)                      Non-motorized (if gear is located near fisher's home)</p>
<p><b>Frequency of maintenance</b>                      Once a month</p>	<p><b>Time fisher hauls net and catch</b>                      Just before low tide</p>
<p><b>Number of days spent on maintenance</b>                      2-3 days</p>	<p><b>Time fisher sets net</b>                      After retrieval of catch</p>
<p><b>Type of maintenance</b>                      Net repair, cleaning</p>	<p><b>Accessories used during fishing operation</b>                      Scoop net                      Flashlight</p>
<p><b>Who performs maintenance?</b>                      Mostly by fisher himself, assisted by relatives</p>	

A *taba* operator may have two sets of net. Each month, he replaces the net so that the used net could be cleaned and mended. It is said that fish would not enter the *taba* if it is full of biofouling organisms such as algae.

## DESCRIPTION OF FISHING OPERATION

In a *taba* fishing operation, fish is retrieved at the codend section. When hauling, the fisher closes the entrance of the *ligaw* and *bunu-an*. Both the *ligaw* and *bunu-an* can be closed by pulling PE twines from the respective openings.

In deepwater units, the fisher hauls the entire codend during hauling. Normally, there is a platform atop the codend where setting and hauling of codend may be performed. The fisher may use a scoop net when retrieving catch.

In shallow-water units, the fisher may be able to walk inside the *taba* because the water has receded during low tide. The *taba* fisher may use a scoop net or he can merely pick up the trapped fish. If hauled during high tide, he hauls the codend atop a platform. If the unit has no platform, the codend is hauled aboard a boat. After retrieving the catch, the codend is again set for another cycle of fish capture.

If the weather permits, *taba* fishing may be conducted at least 22-23 days in a month. Because the gear is tide-dependent, there is no operation for 4 days each during the first and third quarter phase of the moon. During these neap tide periods, water movement in the estuary is slow resulting to minimal fish transport by tidal currents.

# FILTER NET

## At a glance

1. A filter net is a stationary fishing gear that is primarily made of post and netting panels that form a conical bag.
2. The mouth of the filter net is set facing the current flow. At the farthest end of the net bag is the codend where fish is trapped and ultimately caught.
3. In the estuaries of New Washington, Altavas and Batan, there are two types of filter nets according to design – the winged type (locally called *saluran*) and the non-winged type (locally called *tangab*).
4. Success of fishing operation is highly dependent on tidal cycles.
5. Because the use of the gear is tide-dependent, time of fishing operation varies according to tidal cycles.
6. In New Washington-Batan estuaries, hauling of filter net codend is performed during ebb tide.
7. A filter net targets species that are carried by tidal currents. Dominant catch includes shrimps, sergestid shrimps, crabs, fish and other invertebrates.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	Oct-Dec; Apr-May	<b>Months:</b>	Jun-Aug; Feb-Mar
<b>Ave. catch per day:</b>	6-10 kg	<b>Ave. catch per day:</b>	2-5 kg
<b>No. of fishing days:</b>	24 days/month	<b>No. of fishing days:</b>	14 days/month



An unsorted catch of a filter net

### Dominant Species Caught



Penaeid shrimps (left) and blue swimming crabs (top) are the dominant species caught using a *saluran*.

## FISH CATCH INFORMATION

### Dominant Species Caught



Gobiidae  
Gobies  
Local name: *Bagtis*



Engraulidae  
Anchovies  
Local name: *Bolinaw*



Sergestidae  
Sergestid shrimp  
Local name: *Banlag*

### Examples of Other Species Caught



Squillidae  
Mantis shrimps  
Local name: *Pitik-pitik*



Portunidae  
Crenate crabs  
Local name: *Kaeantugas*



Mugilidae  
Mulletts  
Local name: *Gusaw, Balanak*

## FISH CATCH INFORMATION

### Examples of Other Species Caught



Alpheidae  
Snapping shrimps  
Local name: *Kadtan*



Anguillidae  
Eel  
Local name: *Ubod*



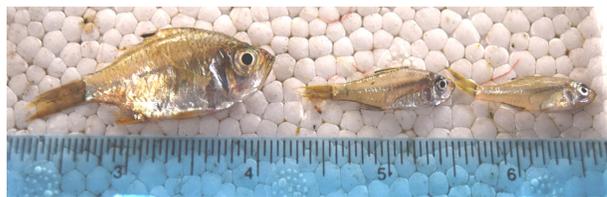
Teraponidae  
Tigerperches  
Local name: *Buga-ong*



Tetraodontidae  
Pufferfishes  
Local name: *Butete*



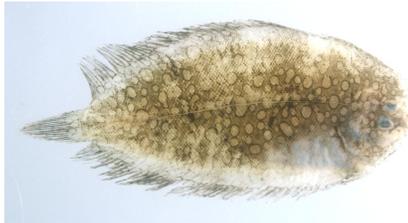
Mullidae  
Goatfishes  
Local name: *Ti-aw*



Ambassidae  
Glassfishes  
Local name: *Bakagan*



Psettodidae  
Turbots  
Local name: *Paead*



Cynoglossidae  
Flatfishes  
Local name: *Paead*



Leiognathidae  
Slipmouths  
Local name: *Sapsap, Aputo*

## DESCRIPTION OF FISHING OPERATION

In the estuary, the filter net is set during high tide with the mouth of the net facing the current flow. The net bag is opened by dropping a pair of anchors that are individually attached to a used tire which in turn is attached to the bamboo post. When the anchors are dropped, the used tires pull down the attached net, thereby stretching the net mouth open. The upper corners of the net mouth are tied to the bamboo poles for proper vertical and horizontal alignment. If the fishing ground is shallow (about 3 m deep or less), the filter net operator may use a bamboo pole to push the footrope into the muddy or sandy substrate. This helps ensure that the net mouth is properly opened.



A *sundong* is a bamboo pole (indicated by arrows) that is used to push the footrope into the muddy or sandy substrate to properly open net mouth.

A filter net is retrieved about an hour before the low tide. To retrieve the net, the ropes attached to the anchors are pulled up either manually or with the aid of an improvised winch. The winch closes the net mouth and brings the mouth of the net to the platform where the fisherman can slowly pull up the net.

The codend is opened atop the platform and catch is lowered into a basket. If the fisherman has an assistant, the assistant brings the boat just below the platform. The assistant who is aboard the boat opens the codend and lowers the catch into basket inside the boat. Alternatively, a fisherman can use scoop net to retrieve catch. After net retrieval, the net is placed on the platform until the next high tide.

# FILTER NET WITH WINGS

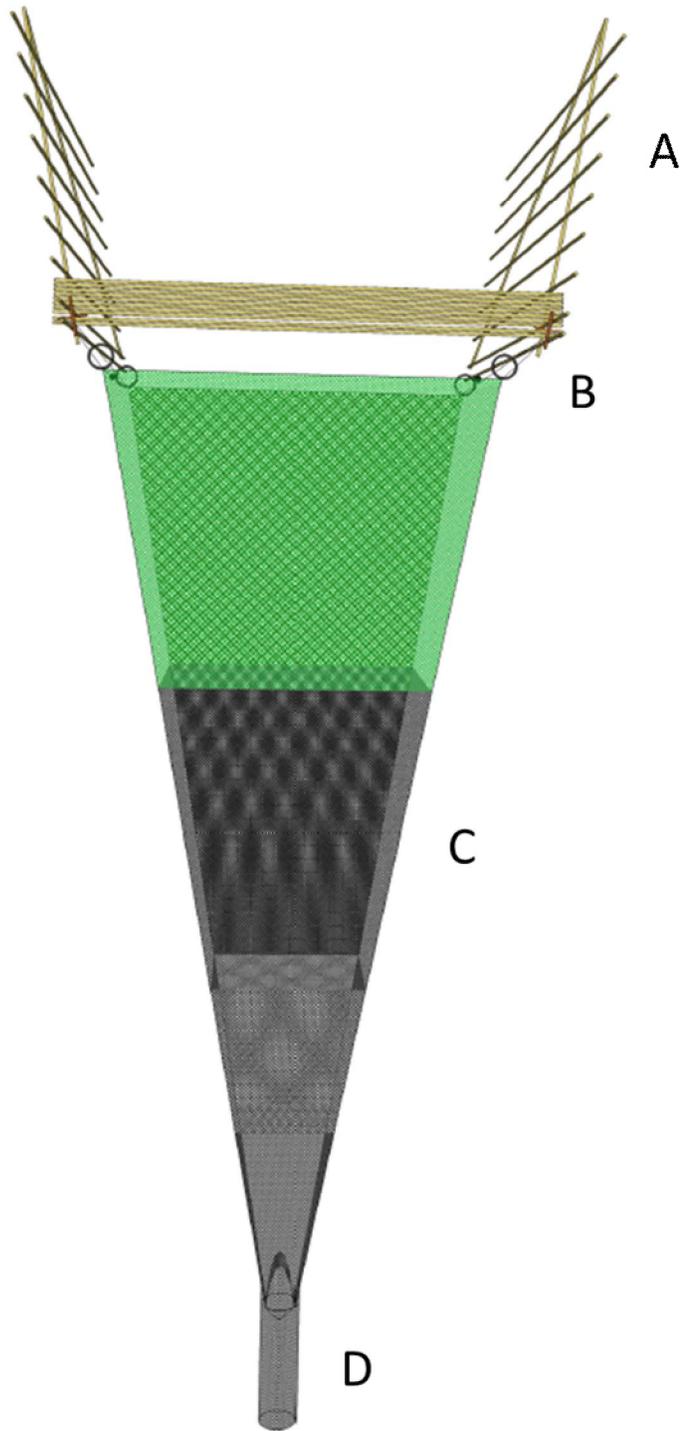
Local Name: *Saluran*



It is common to see a series of filter nets interconnected by bamboo bridges. These filter nets are often owned by a single fisherman.

## GEAR DESCRIPTION

### Parts of a *Saluran*



A—Wings

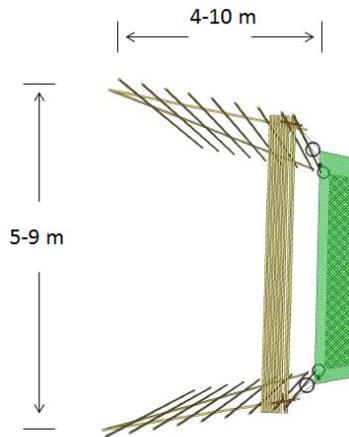
B—Net mouth

C—Net body

D—Codend

## GEAR DESCRIPTION

### Parts of a *Saluran*



A *saluran* net mouth preceded by a paired row of bamboos that serve as wings. The net is attached to the main bamboo posts, locally called *tularok*.

### Wings (*Taktakon*)

#### **Function**

The bamboo poles serve as attachment area to keep the mouth of the net open. The pair of wings provide additional stability of the structure. In addition, the wings allow the construction of a platform above the water surface where the fisherman performs fishing operations.

#### **Materials Used**

Bamboo poles

A. Main post: 2-4 pcs, 1st class

B. For Wing construction

Number: 24-50 pcs.

Type: usually 2<sup>nd</sup> class

Length: 6-9 m

C. For Platform construction

Number: 6-10 pcs.

Type: usually 2<sup>nd</sup> and 3<sup>rd</sup> class

PA twine: No. 150 (diameter 1.5 mm)

#### **Description**

1. Each wing may have about 8-25 bamboo poles that are arranged almost like a letter "V". The interval between each bamboo may be from 0.3 to 1 m.
2. The main posts (*tularok*) are the poles where the net mouth is attached.
2. Bamboo poles are buried at about 1-1.5 m deep into the substrate.
3. Additional bamboos are placed horizontally or diagonally for added support. PA and/or PE twines are used for tying bamboo poles.
4. The wings are bridged together using separate bamboo poles that are placed horizontally above the water surface. The bridge serves as a platform for setting and hauling operations.

## GEAR DESCRIPTION

### Parts of a *Saluran*

<b>Mouth of the Net (<i>Baba-an</i>)</b>	
<p><b>Function</b></p> <p>The mouth of the net allows the entry of fish, shrimps, crabs, and other organisms carried by the tidal current into the net. It is imperative that this part of the net is wide open. Otherwise, fish cannot enter the net and fishing operation would not be successful.</p>	<p><b>Materials Used</b></p> <p>Headline, groundline, skirtline, and pulling lines: either PE (No. 22, 16, 20, 12) or PVA (No. 22, 14)</p> <p>Anchors: Bag of stones, 10 kg each bag</p> <p>Used tires, 4-6 pcs</p> <p>Weights (optional): Stone, 1 kg each</p>

#### **Description**

1. The mouth of the filter net is framed by a headline, groundline and skirtlines. It usually spans from the bottom (seafloor) to about 1 m from the surface.
2. To keep the upper part of the net mouth in position, each end of the headline is attached to a used tire, which in turn, is attached to the nearest bamboo pole that forms part of the wings. Floats are not necessary.
3. To keep the net properly opened, anchors are attached to both ends of the groundline. The two ends of the groundline are similarly attached to used tires, which in turn, are attached to bamboo posts. When the anchors are dropped, the used tires, along with the groundlines, sink with the anchors thus effectively opening the net mouth (see picture on the left).
4. Depending on the width of the net mouth, additional weights may be used to keep the bottom part close to the bottom.
5. The mouth of the net is usually 6-9 m high. Some units may be as low as 4 m and as deep as 12 m. Width of opening is usually 3-5 m, although some units may be as wide as 9 m.



Above: Used tires placed around the bamboo post facilitate lowering and raising of filter net. When the attached anchor is lowered, the used tires and net follow.

## GEAR DESCRIPTION

### Parts of a *Saluran*

Net Body	
<i>Function</i>	<i>Materials Used</i>
The net body sieves the water column to capture fish.	Netting panel Type: HDPE Raschel knotless Mesh size: various mesh sizes used, see table below PA twines, No. 150, diameter 1.5 mm

#### *Description*

Part of the net	Length (m)	Depth (m)	Mesh size	Mesh size (cm)
Fore section	5	5.25 – 6	No. 11	2.40
Middle section	5	3 – 5.25	No. 14	2.35
Rear section	2.5	1.5 – 3	No. 17	1.60
Codend ( <i>Puyo</i> )	4	0.3 – 1.5	No. 22	0.40

1. The body of the filter net assumes a conical shape.
2. It is made of netting materials with at least three mesh size openings.
3. The mesh opening decreases in size from the net mouth area towards the codend.

Codend ( <i>Puyo</i> )	
<i>Function</i>	<i>Materials Used</i>
The codend is the part of the net where fish is retained.	Netting panel: HDPE knotless net, 0.4 cm mesh opening Twine for tying: (PA, PE, PVA; No. 10, 14, 22) PET bottle: 1 pc, serves as marker

#### *Description*

The codend is at the farthest end of the filter net. To close the codend, a twine is used to tie the opening. It also allows for easy opening after fish retrieval.

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost of unit</b> 10,000-20,000 pesos Cost depends on size and depth of gear</p> <p><b>Who constructs gear?</b> Usually by hired labor</p> <p><b>Number of days spent on construction</b> 12-20 days</p> <p><b>Frequency of maintenance</b> 2-5 times per year</p> <p><b>Number of days spent on maintenance</b> 1-3 days</p> <p><b>Type of maintenance</b> Net repair and cleaning</p> <p><b>Who performs maintenance?</b> Usually by fisher himself, Assisted by son, other family Members, or by hired labor</p>	<p><b>Number of fishers</b> 1-2 persons Assistant is usually the fisher's son or another relative Sorting of catch is often performed by fisher and his family (e.g., wife)</p> <p><b>Boat used</b> Either motorized or non motorized</p> <p><b>Time</b> Net is set: During high tide Net is hauled: ~ 1 hour before low tide</p> <p><b>Time spent</b> Travelling to fishing ground : 30-60 min Actual fishing: 60 – 90 min Sort fish catch: ~ 15-30 min Total time spent fishing: ~ 2-3 hrs</p> <p><b>Operating cost</b> About 40 pesos (to pay for gasoline used by fishers using motorized boats)</p>

Filter nets are constructed in areas where there is a presence of tidal currents. The *saluran* in the Aklan estuaries are mostly located in the New Washington area. They are present in both deep (~9-12 m) and relatively shallow (~4 m) areas. Some units are present in the upstream areas.

# FILTER NET

Deep-water, Non-winged Type

Local Name: *Tangab*

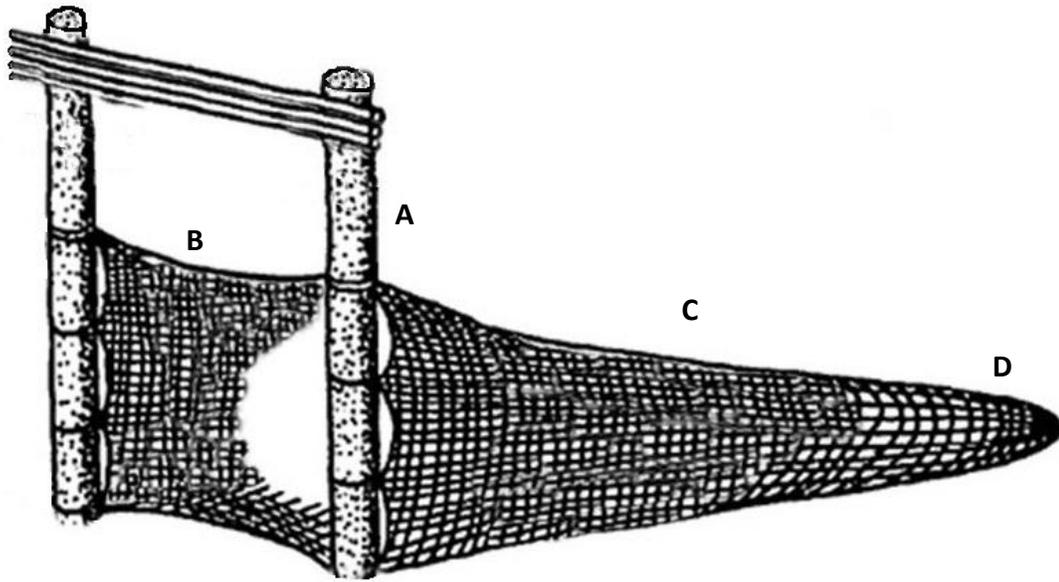


## At a glance

1. There are two designs of *tangab* in New Washington-Batan-Banga Bay estuaries: a deep-water and a shallow-water variant.
2. The variations in design are primarily due to differences in the physical characteristics of the fishing ground.
3. A deep-water *tangab* is bigger and is set at a depth of about 10 m. A shallow-water *tangab* is smaller and is set at a depth of about 3.5 m.
4. A deep-water *tangab* uses coconut trunks as posts; a shallow-water *tangab* uses bamboo poles instead.
5. Construction of a deep-water *tangab* is naturally costlier.
6. A *tangab* targets species that are carried by tidal currents. Dominant catch includes penaeid shrimps, sergestid shrimps, crabs, fish and other invertebrates.

## GEAR DESCRIPTION

### Parts of a *Tangab*

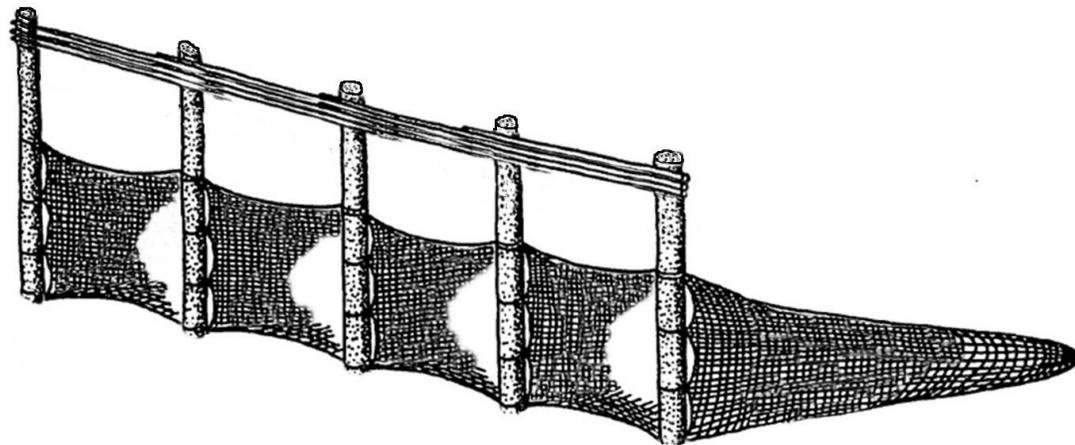


A—Post

B—Net mouth

C—Net body

D—Codend



It is not unusual to see a series of filter nets in estuaries. These units are often owned by a single fisher.

## GEAR DESCRIPTION

### Parts of a *Tangab*

Post and Platform	
<p><b>Function</b></p> <p>The pair of trunks that are placed at the fore of the gear serves as pillars for the <i>tangab</i>. The posts help ensure that the mouth of the net is properly opened during fishing operation. In addition, a bridge made of bamboo is constructed between the two posts and serves as platform for fisher during fishing operations.</p>	<p><b>Materials Used</b></p> <ol style="list-style-type: none"> <li>1. For posts: Coconut trunk (2 pcs)</li> <li>2. For platform: Bamboo poles, 3-6 pcs</li> <li>3. Twine cable: PE</li> <li>4. Wooden pegs, 12 pcs</li> </ol>

#### **Description**

Coconut trunks are buried at about 1 m deep into the substrate. As an added support, the posts are staked using PE ropes that are attached to wood pegged at the bottom. The net is attached to the trunks for support and also to keep the net mouth open. The posts should be sturdy enough to withstand water current.

A bamboo bridge is constructed linking the two coconut posts. The bridge serves as a platform for fisher during fishing operations.

Net Mouth	
<p><b>Function</b></p> <p>The mouth of the net allows the entry of fish, shrimps, crabs and other organisms carried by the tidal current into the net. It is imperative that this part of the net is wide open. Otherwise, fish is not transported into the net and fishing operation would not be successful.</p>	<p><b>Materials Used</b></p> <ol style="list-style-type: none"> <li>1. Headline, groundline, skirtlines and pulling lines</li> <li>2. Anchors: 2 bags with stones, ~10 kg each</li> <li>3. Sinkers (optional): Lead, 30-50 cm interval</li> <li>4. Used tires: 4-6 pcs</li> <li>5. Twine for tying: PE, usually No. 22</li> </ol>

## GEAR DESCRIPTION

### Parts of a *Tangab*

#### Net Mouth

##### **Description**

The mouth of the net usually spans from the bottom (seafloor) to about 1-2 m below the water surface. This reduces the probability that debris carried by the tidal currents get in contact with the netting material, thereby reducing probability of damage.

Used tires are attached to the four ends of the net mouth. Also attached to the bottom tires are stone anchors. When the tires and anchors are released, the tire sinks along the coconut post. As the tire and anchors sink, the net mouth opens. To keep the upper part of the net in position, the upper corners of the net mouth are attached to the platform and in the upper portion of the coconut trunks. Floats are usually not necessary.

#### Net Body

##### **Function**

The net body sieves the water column to capture fish.

##### **Materials Used**

Netting panel

a. Type: PA, Kuralon, Pamo

b. Mesh size: Variable according to position in the net (see table below)

Twines

a. Type: PA or PE (diameter 1.5 mm)

##### **Description**

Part of the net	Type of netting material	Length (m)	Mesh size (cm)
Net mouth	PA, knotted	~5-10 meshes	6-10
Fore	PA, knotted	9	5
Middle	PE, knotted	3	3.5
Codend	Raschel, knotless	10.5	0.4

The body of the filter net assumes a conical shape. It is made of netting materials with at least three mesh size openings. The mesh opening decreases in size from the net mouth area towards the codend.

## GEAR DESCRIPTION

### Parts of a *Tangab*



Net material and mesh opening along the various parts of a filter net. A) Net mouth, B) Fore, C) Middle and D) Codend.

<b>Codend (<i>Puyo</i>)</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
<p>The codend is the part of the net where fish is retained.</p>	<ol style="list-style-type: none"> <li>1. Netting panel Type: HDPE Raschel net, knotless Length: ~10 m</li> <li>2. Twine for tying: PE and PA</li> <li>3. Float as marker, 1 pc</li> </ol>

***Description***

The codend is at the farthest end of the filter net. To close the codend, a twine is used to tie the opening. It also allows for easy opening after fish retrieval.

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 15,000 pesos</p> <p><b>Who constructs gear?</b> By fisher and hired labor</p> <p><b>Number of days spent on construction</b> 15-20 days</p> <p><b>Frequency of maintenance</b> Twice a month</p> <p><b>Number of days spent on maintenance</b> 2-3 days</p> <p><b>Type of maintenance</b> Net repair and cleaning</p>	<p><b>Number of fishers</b> 1 – 2 persons Sorting of catch is performed by fisher and wife or other family members</p> <p><b>Boat used</b> Either motorized or non motorized</p> <p><b>Time</b> Net is set: During high tide Net is hauled: 1-2 h before end of ebb tide</p> <p><b>Time spent</b> Travelling to fishing ground and back: 30 – 60 min Actual fishing: 60 – 90 min Sort fish catch: ~ 15-45 min</p> <p><b>Total time spent fishing:</b> ~ 2-3 hrs</p>

A *tangab* is often constructed in waters that are about 10 m deep. Since fishing operation is dependent on tidal currents, this gear is situated in areas where tidal currents are stronger.

A *tangab* is set during high tide. When water starts to recede, ebb current is created. This tidal current carries along a diverse and abundant supply of fish. The mouth of the net is set facing this current to passively capture fish.

# **FILTER NET**

## **Shallow-water, Non-winged Type**

### **Local Name: *Tangab***

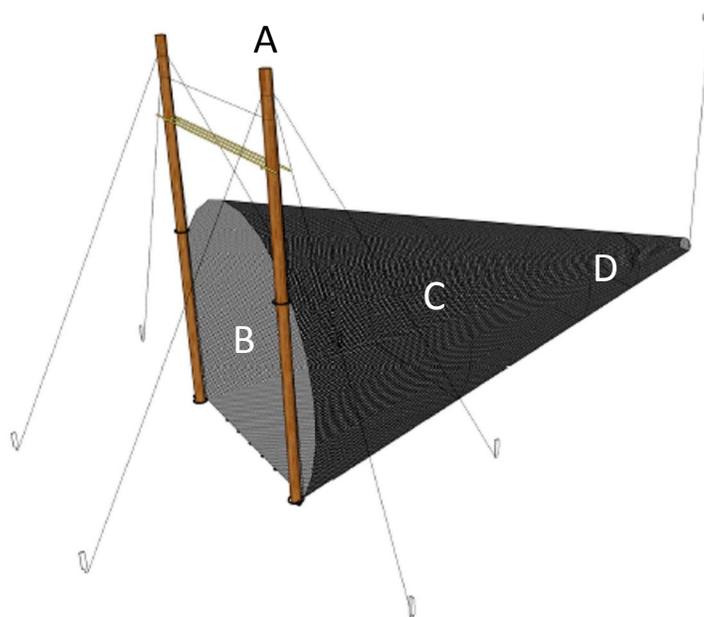


### **At a glance**

1. The shallow-water *tangab* is smaller than the deep-water variant. It is set at a shallower depth, about 3-4 m. The posts are made of bamboo.
2. Fishing operation is normally conducted by a single person. Additional help is usually a family member, such as the fisher's son, brother or wife.
3. Small *tangab* operators usually use non-motorized boats.
4. Because the shallow-water variant is smaller and is constructed using bamboo instead of coconut, cost of construction is lower compared to the deep-water variant. A unit costs about 3,000-7,000 pesos.
5. The smaller *tangab* allows easy transfer of the unit. Depending on the amount of fish available in a specific place, a small *tangab* operator can easily uproot the bamboo posts and transfer to another fishing area.

## GEAR DESCRIPTION

### Parts of a *Tangab*



A—Post

B—Net mouth

C—Net body

D—Codend



The posts of a small *tangab* is constructed using bamboo (left). The mouth of the filter net should be properly opened to allow entry of fish carried by water current (right).

## GEAR DESCRIPTION

### Parts of a *Tangab*

Posts and Platform	
<p><b>Function</b></p> <p>The bamboo posts serve as pillars. The posts ensure that the mouth of the net is properly opened during fishing operations. The bamboo poles are linked by a bridge made of additional bamboo poles. The bridge serves as a platform where a fisherman can perform setting and hauling of net, and where net can be hung when not used.</p>	<p><b>Materials Used</b></p> <p>Bamboo poles (Main pillar)            Number: 4-6, 1st class            Length: 7-9 m            Diameter: 13-15 cm            Twine (for tying) – PE</p> <p>Bamboo poles (Bridge/Platform)            Number: 2-4 pcs            Type: 2<sup>nd</sup> class</p>
<p><b>Description</b></p> <p>Bamboo poles are buried about 1 m deep into the substrate. A bamboo bridge is constructed linking the two bamboo posts. The bridge serves as a platform for fisherman during fishing operations. When not in use, the net is hung in the platform. The net is attached to the standing bamboo pillars for support and also to keep the net mouth open.</p>	
Net Mouth	
<p><b>Function</b></p> <p>The mouth of the net allows the entry of fish, shrimps, crabs and other organisms carried by the tidal current into the net. This part of the net should be wide open. Otherwise, fish is not transported into the net and fishing operation would not be successful.</p>	<p><b>Materials Used</b></p> <p>Netting panel            Type: Nylon or HDPE knotless            Mesh size: No. 13 or 14            Net height: 3-5 m            Net width: 6 m            Twine: PA, No. 17 or 20.            Headrope, footrope and skirtlines            Pulling lines used for setting and hauling            Anchors: Bag of stones, 2 pcs, 10 kg each</p>

## GEAR DESCRIPTION

### Parts of a *Tangab*

#### Net Mouth

##### **Description**

1. The mouth of the net usually spans from the bottom (seafloor) to the surface.
2. To keep the net close to the bottom, a pair of anchors is attached at the bottom corner of the net. In addition, a footrope with lead sinkers is also attached.
3. Since the fishing ground is shallow, the *tangab* operator uses a bamboo pole to push the footrope into the substrate.
4. To keep the upper part of the net in position, the upper corners of the net mouth are attached to the bamboo pillars. Floats are usually not necessary.
5. To facilitate the lowering and raising of the net, pulling lines are used.

#### Net Body

##### **Function**

The net body sieves the water column. Fish that enters net are led to the codend.

##### **Materials Used**

Netting panel: PE (knotted), HDPE Raschel net (knotless),  
Mesh size: various sizes depending on net location  
Twines (for joining netting panels): PA, PE

##### **Description**

Just like other filter net designs, the small-variant *tangab* assumes a conical shape. The gear is composed of netting materials with at least three mesh size openings. The mesh opening decreases in size from the net mouth area towards the codend.

#### Codend (*Puyo*)

##### **Function**

The codend is the part of the net where fish is retained.

##### **Materials Used**

Netting panel: HDPE Raschel net, knotless  
Length: ~10 m  
Twine for tying: PA, PE  
Float as marker

##### **Description**

The codend is at the farthest end of the filter net. To close the codend, a twine is used to tie the opening. It also allows for easy opening after fish retrieval.

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 3,000-7,000 pesos</p>	<p><b>Number of fishers</b> 1 person</p>
<p><b>Who constructs gear?</b> Usually fisher himself, may hire laborer</p>	<p><b>Boat used</b> Either motorized or non motorized</p>
<p><b>Number of days spent on construction</b> 10-15 days</p>	<p><b>Time</b> Net is set: During high tide Net is hauled: ~1 h before end of ebb tide</p>
<p><b>Frequency of maintenance</b> Every week</p>	<p><b>Time spent</b> Travelling to fishing ground and back: 30 – 60 min Actual fishing: 60 – 90 min Sorting of catch: ~ 15-45 min</p>
<p><b>Number of days spent on maintenance</b> 1 day</p>	
<p><b>Type of maintenance</b> Net mending</p>	



Sorting of filter net catch is a family affair that involves women and sometimes children.

# LIFT NET

Local Name: *Bintahan*

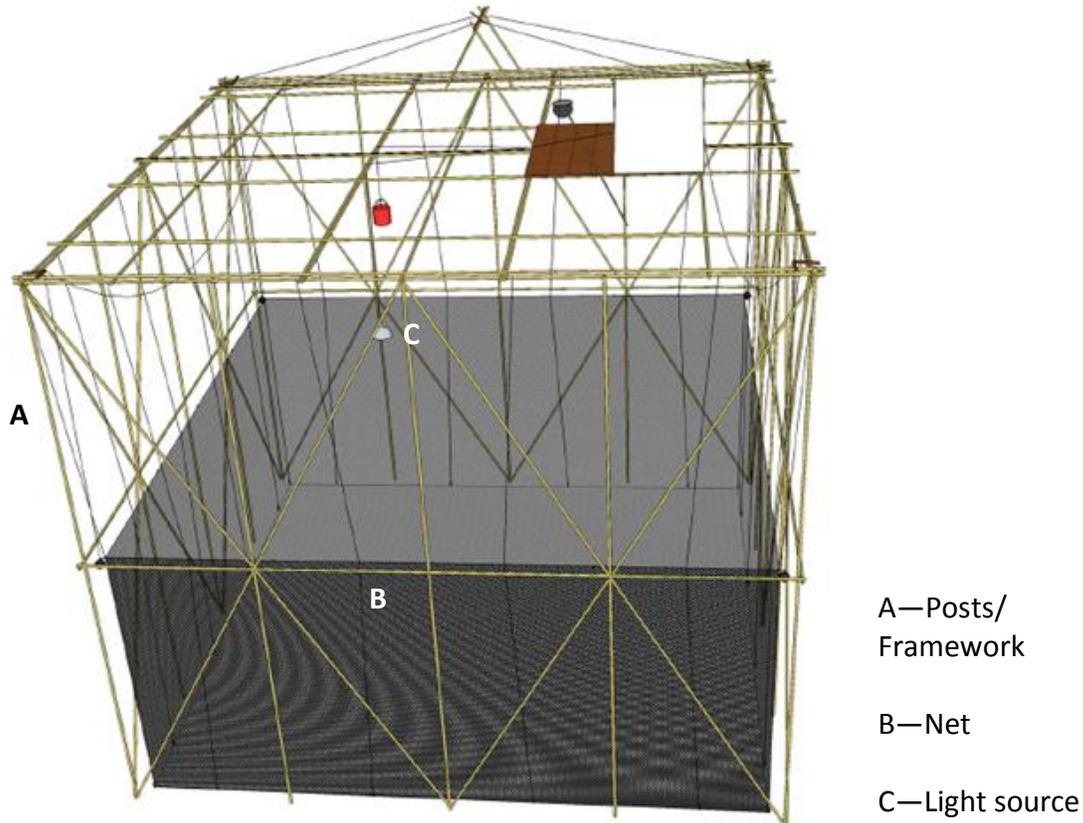


## At a glance

1. A lift net is a fixed fishing gear that is primarily made of bamboo and netting panels that form a bag.
2. The net is set at night and light is used to attract fish over the submerged net. Once there is enough fish, net is hauled using an improvised pulley system.
3. Fishing operation is normally conducted by a single person. Depending on fish availability, a lift net operator may set and haul the gear 1-4 times in a night.
4. Dominant catch of lift nets inside the estuary are juvenile anchovies, mullets, sergestid shrimps and other fish.
5. Construction cost ranges from 15,000 to 50,000 pesos depending on the depth of the fishing ground and the size of the net.

## GEAR DESCRIPTION

### Parts of a *Bintahan*



- A—Posts/  
Framework
- B—Net
- C—Light source

Framework	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
<p>The bamboo framework provides attachment for the net. In addition, the top portion serves as a platform during the setting and hauling of net.</p>	<p>Bamboo poles                      Number: 50-100 pcs                      Type: Mostly 1<sup>st</sup> class                      PE and PA twine</p>

***Description***

The framework consists of two parallel rows of bamboos that are permanently staked on the substrate. The bamboo framework assumes a square design. The bamboo rows are supported by additional bamboo braces and catwalks. A small hut is constructed atop the framework allowing the fisher refuge from rain and wind.

## GEAR DESCRIPTION

### Parts of a *Bintahan*



The framework of a *bintahan* is made of bamboo poles that are partly buried at the substrate to keep the posts standing and stable. The netting is attached on the four corners of the framework. The fisher conducts fishing operation atop the structure. One the platform is a small hut for refuge at night or when there is rain and an improvised pulley system used to lower or raise the net.



The *bintahan* net body is made of PE Raschel, square, knotless netting with a 4 mm mesh opening. A PE twine is inserted at the edges of the net to serve as skirtline.

## GEAR DESCRIPTION

### Parts of a *Bintahan*

Net Body	
<b>Function</b>	<b>Materials Used</b>
When net is lifted to the surface, it captures fish that have aggregated under the platform.	HDPE Raschel net, square, knotless
<b>Description</b>	
Each side of the net may be 10-25 m long. Net dimensions vary according to the length, width and depth of the bamboo framework. The net material is usually PE Raschel square, knotless mesh with 4 mm opening.	

Skirtline and Weights	
<b>Function</b>	<b>Materials Used</b>
The skirtline maintains the shape of the net body. Also, it is attached to the series of rope systems that form part of the pulley system.	PE twines (skirtline) PE and/or PA twines (for tying) Weights and sinkers Material: Lead or stone Number: 4-12
The weights facilitate sinking of the net and keep the net body close to the substrate.	

**Description**

Each corner of the net body is provided with 2-3 stones or lead weights to facilitate sinking of the net.

## GEAR DESCRIPTION

### Parts of a *Bintahan*



The net body is kept submerged close to the substrate using stones as weight (encircled). Notice the pulling line attached to the net corner which passes through the pulley system.

#### Pulley System

##### **Function**

The improvised pulley system facilitates lowering and hauling of the net.

##### **Materials Used**

Bamboo pole (~2 m long, 15 cm wide)  
 Bamboo stick (lever)  
 Bamboo posts (4 pcs, ~1.5 m long)  
 Wooden rings  
 PE ropes (pull ropes)

##### **Description**

The pulley system is constructed on the platform. It consists of a bamboo pole that rests atop a pair of bamboo stands. The bamboo pole is revolved using a bamboo lever that is attached through the bigger pole. When the bamboo pole is rotated, the pull ropes are either released or hauled. In the four corners of the framework, each corner/post is provided with rings where the pull ropes pass through.

## GEAR DESCRIPTION

### Parts of a *Bintahan*



A *bintahan* fisher using an improvised pulley system to lower and raise the net. The pulley system is made of a series of PE ropes attached to a bamboo pole that is revolved in place using a bamboo lever to pull or release rope.



A *bintahan* works by using light to lure fish over the submerged net. The most popular light sources are pressurized lamp (left) and electrical fluorescent lamps (right).

## GEAR DESCRIPTION

### Parts of a *Bintahan*

Light Source	
<b>Function</b>	<b>Materials Used</b>
Light is used to lure fish under the bamboo platform and over the submerged netting.	Petromax (pressurized kerosene lamp): 1 unit, or Electric bulb (fluorescent, 18-50 watts): 2-3 units Bucket, red colored Power source (if using electric bulb): usually AC, sometimes generator

#### **Description**

Many liftnet operators in the New Washington-Batan-Banga estuaries use electricity to power their lamps. To connect to a power source, the operator needs to construct a series of bamboo posts from the electric source to the liftnet. The power source may come from the fisher's house. If the fisher's house is situated far from his liftnet, he may connect from the nearest household, usually for a fee.

The light source is lowered at the center of the framework until about 2 m from the water surface. A PE rope is used to lower and raise light source during fishing operation.

## FISH CATCH INFORMATION

Peak Season	Lean Season
<b>Months:</b> Oct to Dec; Apr to May	<b>Months:</b> Jul to Aug; Jan to Feb
<b>Ave. catch per day:</b> 10-30 kg	<b>Ave. catch per day:</b> 0.5-3 kg
<b>No. of fishing days:</b> 19-25 days/month	<b>No. of fishing days:</b> 10-21 days/ month

## FISH CATCH INFORMATION

### Dominant Species Caught



Engraulidae  
Anchovies  
Local name: *Bolinaw*



Clupeidae  
Sardines  
Local name: *Tabagak*



Sergestidae  
Sergestid Shrimp  
Local name: *Banlag*



Ambassidae  
Glassfishes  
Local name: *Bakagan*



Atherinidae  
Silversides

## FISH CATCH INFORMATION

### Examples of Other Species Caught



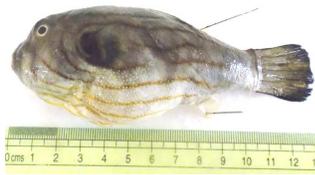
Penaeidae



Hemiramphidae



Terapontidae



Tetraodontidae



Ophichthidae



Apogonidae



Portunidae



Scorpaenidae



Carangidae



Mullidae



Triacanthidae



Gobiidae



Pomacentridae

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 15,000 to 50,000 pesos</p> <p><b>Who constructs?</b> Mainly by hired labor</p> <p><b>Number of days spent on construction</b> 12-18 days</p> <p><b>Frequency of maintenance</b> 2-5 times per year</p> <p><b>Number of days spent on maintenance</b> 1-3 days</p> <p><b>Type of maintenance</b> Net repair, cleaning</p> <p><b>Who performs maintenance?</b> Mostly by fisher himself, assisted by family members or hired labor</p>	<p><b>Number of fishers</b> Usually one person, sometimes two</p> <p><b>If more than 2 fishers, who helps fisher?</b> Usually the fisher's son or another Relative. Sorting of catch performed by fisher and his wife or other family members</p> <p><b>Boat used:</b> Usually motorized</p> <p><b>Time set net</b> Between 4:30 to 7:30 PM</p> <p><b>Number of hauls per night</b> 2-5 times</p> <p><b>Time finished fishing</b> ~ 5:00 AM</p> <p><b>Total time spent fishing:</b> ~ 10-12 hrs</p>



Operational cost may range from 60-200 pesos per fishing trip. This includes cost of kerosene or electricity, and gasoline for those using motorized boats.

Because fishing operation utilizes light to attract fish, fishing operation is often suspended 2-3 days before and after the full moon. During this period, the fisher usually mends net/ framework damage.

A fisher assisted by hired labor during construction of a *bintahan* (above). Construction of the framework takes about 8-10 days to finish. Net construction takes about 4-8 days.

## DESCRIPTION OF FISHING OPERATION

A *bintahan* is operated at night. The fisher usually sets the net at dusk. To lower and raise the net, he uses an improvised pulley system that is composed of bamboo, PE ropes and rings. Once the net has been lowered, it is kept submerged using sinkers that are attached in every corner of the net.

The light source is then turned on to attract fish. The lamp is usually lowered until about 2 m from the water surface. The length of time spent attracting the fish depends on the amount of fish that has been lured into the net. The fisher can monitor fish quantity from the platform. When there is sufficient amount of fish present, the fisher dims the light (when using the Petromax). When he uses an electric bulb, he turns on the bulb that is covered in red bucket. He then switches off the main light used for luring. By dimming the Petromax (or using the red light), fish that have been lured towards the liftnet are further aggregated into a smaller area. Once the fish has aggregated over the submerged net, the fisher hauls the net body using the improvised pulley system. Captured fish is retrieved using a scoop net and stored in a polystyrene box. When catch is good, the fisher would again lower his net and start the capture process. Depending on fish availability, a *bintahan* operator may perform fishing operation 1-4 times in a single night.

Fishing operation could last the whole night thus the fisher spends the entire night atop the *bintahan* platform. During the period when fish are being lured using light, the fisher finds opportunity to sleep. The platform usually has a small hut where the fisher can sleep and take refuge from rain or cold weather.

Fishing ends at twilight. By this time, the net has been raised. The net is often left hanging from the platform for easy setting the following night. The fisher brings the caught fish to his residence where catch is sorted with the help of his family members.

# BAITED LIFT NETS

Local Name: *Batak-batak*

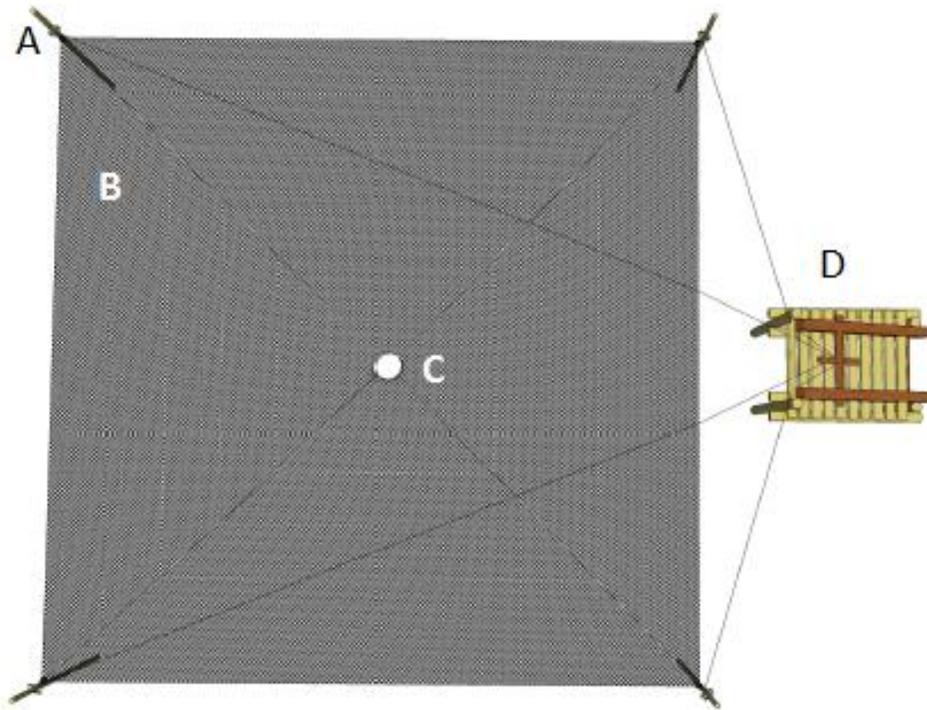
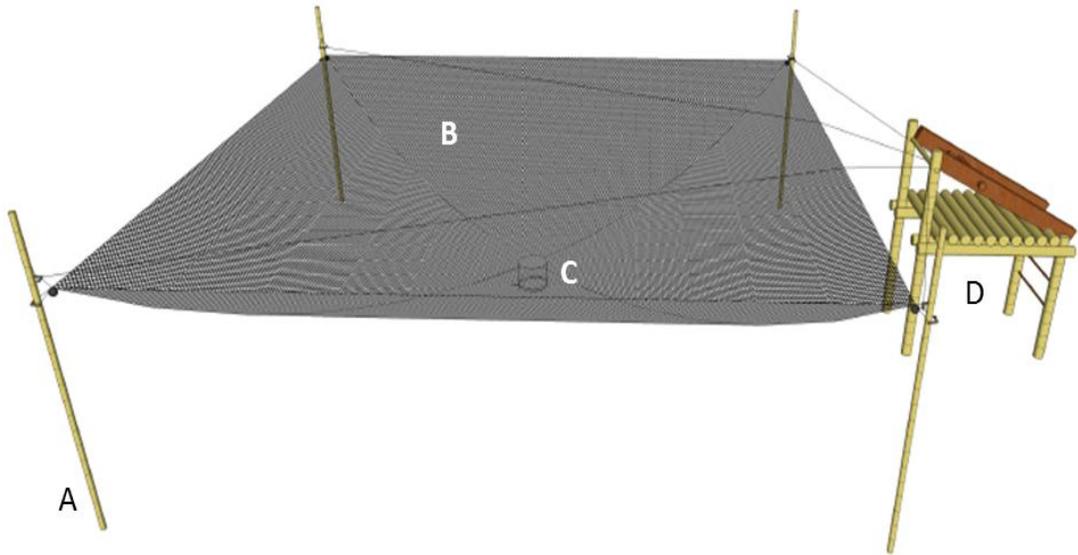


## At a glance

1. A *batak-batak* is a type of lift net that primarily targets shrimps. Other species caught are mullets, rabbitfishes, crabs, gobies and other small fishes.
2. It is made of a square netting that is supported by bamboo posts in each corner. The netting may or may not have a bunt.
3. The net is lowered using an improvised pulley system.
4. Fish are lured into the submerged net using baits composed of ground bivalves. When set at night, the fisher uses light as additional lure.
5. Fishing operation may be conducted daytime or nighttime.
6. Average construction cost of a *batak-batak* is PhP 6,500. Larger gears cost more.

## GEAR DESCRIPTION

### Parts of a *Batak-batak*



A—Post

B—Net body

C—Codend

D—Platform

## GEAR DESCRIPTION

### Parts of a *Batak-batak*

Posts	
<b>Function</b>	<b>Materials Used</b>
The bamboo posts support the net during fishing operation.	Bamboo poles: 1st class, 4 – 16 pcs Twine: PA, #180

#### **Description**

The posts form the four corners of the fishing gear. To keep the posts standing in the fishing ground, one end of the bamboo pole is pushed against the substrate until it is buried at a depth 1-2 m. Some owners prefer to form a tripod at each corner, so that the posts become more stable. Other fishers, to cut on cost, prefer to have a single bamboo pole buried in each corner. Each post serves as attachment for the net.



A *batak-batak* has four posts where the net body is attached. The bamboo poles are partly buried in the substrate to make the posts standing. Oftentimes, a tripod is formed for each post. At far right is a platform which houses a small hut (where fisher can seek refuge at night or during rainy weather) and a pulley system that is used to lower and raise net body.

## GEAR DESCRIPTION

### Parts of a *Batak-batak*

Net Body	
<b>Function</b>	<b>Materials Used</b>
<p>The net body facilitates capture by enclosing organisms that have been lured and aggregated atop the submerged net.</p>	<p>Netting panel                      Material: PE, Raschel type, knotless                      Mesh: usually #17, sometimes #22</p> <p>Sinkerline                      Material: PA or PE, #180</p> <p>Weights                      Material: Lead or stone                      Number: 4 pcs</p>

#### **Description**

The *batak-batak* net assumes a square shape. Each side of the net may be 6-20 m long, depending on the capacity of fisher to invest. The net is made of PE Raschel diamond-mesh, knotless material. A sinkerline is placed by passing twine through the mesh openings along the netting edge. Weights are placed at each corner.

Codend	
<b>Function</b>	<b>Materials Used</b>
<p>The part of the net where fish are collected and retrieved.</p>	<p>Netting material: PE, Raschel type, knotless</p> <p>Twine (for tying): PA or PE</p>

#### **Description**

The codend is usually made of the same netting material used in the net body. It is placed at the center of the net body. To form the codend, the two sides of a 1 x 1 m netting are joined to create a cylinder. One end of the cylinder is joined to the net body. The other end is closed by tying a twine that is passed through the mesh openings. At the end of a fishing operation, the codend is opened by untying the twine.

## GEAR DESCRIPTION

### Parts of a *Batak-batak*



The improved pulley system in a baited lift net *batak-batak*. It is composed of a series of pulling lines that pass through the top of bamboo posts and connect to a piece of bamboo pole that is rotated in place.

#### Platform and Pulley System

##### **Function**

The platform houses the improved pulley system that is used to lower and raise the net.

##### **Materials Used**

Bamboo poles: 1st class, 10-15 pcs  
Twine (pulley system): PE  
Twine (for tying): PE and PA

##### **Description**

When hauling the net, the lines from the net corners pass over an improvised bamboo or wooden hanger that is placed atop the bamboo posts and run through a pulley system. The improvised pulley system is made of a piece bamboo pole that serves as lever and PE rope that are attached to the four corners of the net body.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	March to May	<b>Months:</b>	July to October
<b>Ave. catch per day:</b>	8-10 kg	<b>Ave. catch per day:</b>	3-5 kg
<b>No. of fishing days:</b>	28-30 days/month	<b>No. of fishing days:</b>	20-28 days/month

### Dominant Species Caught



Penaeidae  
Shrimps  
Local name: *Batod, Pasayan, Sugpo*



Mugilidae  
Mulletts  
Local name: *Gusaw, Balanak*

### Examples of Other Species Caught



Portunidae  
Blue swimming crab  
Local name: *Kasag*



Portunidae  
Indo-Pacific swim-  
ming crab



Leiognathidae  
Slipmouths  
Local name: *Sapsap, Aputoe*



Gobiidae  
Gobies  
Local name: *Tanga*



Siganidae  
Rabbitfishes  
Local name:  
*Bueawis, Danggit*



Terapontidae  
Tigerperches  
Local name:  
*Bugaong*



Tetraodontidae  
Pufferfishes  
Local name: *Butete*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 3,000 to 12,000 pesos</p> <p><b>Who constructs?</b> Fisher himself or by hired labor</p> <p><b>Number of days spent on construction</b> 3-5 days</p> <p><b>Frequency of maintenance</b> 1-2 times per year</p> <p><b>Number of days spent on maintenance</b> 1-2 days</p> <p><b>Type of maintenance</b> Repair of net or bamboo post, cleaning</p> <p><b>Who performs maintenance?</b> Mostly by fisher himself, assisted by family members</p>	<p><b>Number of fishers</b> One person</p> <p><b>Boat used</b> Usually non motorized</p> <p><b>Time set net</b> Usually before the shift in tidal currents</p> <p><b>Soaking time</b> 2-4 hours</p> <p><b>Number of hauls per day or night</b> 1-3 times</p> <p><b>Cost per operation</b> 50-100 pesos per fishing trip to cover cost of bait and kerosene/electricity (if using light as lure). If fisher uses motorized boat, an additional 50 pesos for gasoline is spent.</p>

The gear is constructed in areas that are about 3-5 m deep. Average construction of a *batak-batak* is about 6,500 pesos. Naturally, the larger the net, the higher the cost becomes.

Fishing operation is normally conducted by a single person, often using a non-motorized boat. The gear may be operated at night or daytime. When fishing at night, the fisher uses light as an additional lure.

Each fishing operation may last 2-4 hours. Thus, a *batak-batak* operator may conduct fishing 2-3 times in a day or night.



An example of an improvised light source used in New Washington-Batan Bay.

## DESCRIPTION OF FISHING OPERATION



A-B: The net is lowered by the fisher (arrow) using an improvised pulley system. The pulley is placed atop a bamboo platform.

C: Once the net is completely submerged, the fisher ensures that the net stays close to the bottom. To do this, the corners of the net are pushed against the substrate using a bamboo pole. Finally, he spreads ground bivalves (bait) over the submerged net. The baits shall lure shrimp and fish into the submerged net. When set at night, the fisher uses light as additional luring device.

D-E: After about 2-4 hours, the net is raised using the pulley system.

F: When net is fully raised, the fisher retrieves catch using a scoop net. When water level is low, he may opt to open the terminal end of the codend and collect captured fish.

# BARRIER NET

Local Name: *Sagpang, Sirada*

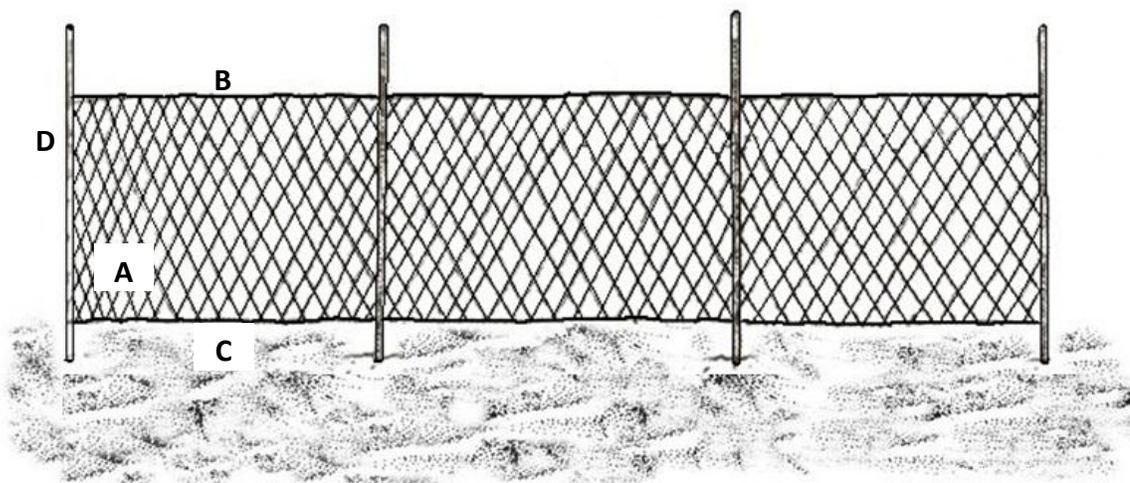


## At a glance

1. A *sagpang* targets fish that move to the mangrove area during high tide. When water recedes during ebb phase, fish wanting to return to the sea are trapped by the barrier net. Success of fishing operation is highly dependent on tidal cycles.
2. Because the use of the gear is tide-dependent, time of fishing operation varies according to the time of flood and/or ebb tide.
3. Filter net operators use either small non-motorized or motorized boats to go to their fishing ground. A few others set their gear close to their house and may not need a boat during fishing operation.
4. Fishing operation is normally conducted by two persons. The fisherman is aided by his son, wife, brother or another relative.

## GEAR DESCRIPTION

### Parts of a *Sagpang*



A - Net

B - Headrope

C - Groundrope

D - Post

#### Net

##### **Function**

The netting wall acts as a barrier that prevents fish from going back into the sea during ebb tide, thus the name “barrier net”.

##### **Materials Used**

Material: PE Raschel knotless or PA

Mesh opening:

Usually No. 17

Also use No. 11, 12, 13, 14, 22

## GEAR DESCRIPTION

### Parts of a *Sagpang*

#### Net

##### **Description**

The length of the net, which varies from 60 to 600 m, depends on the area that a fisher wishes to enclose during high tide. Net height (about 2.6 to 3.2 m) is usually 100 meshes.

#### Posts

##### **Function**

The posts serve as pillars for the netting wall. It keeps the netting in upright position and to prevent netting from being carried by the outgoing tidal currents.

##### **Materials Used**

Bamboo or tree branches  
 Type: 3<sup>rd</sup> class  
 Quantity: 20-200 pcs

##### **Description**

Bamboo poles are often used as posts. Fishers may, however, use tree branches to save on costs. The posts are buried about 1 m deep at about 3 m intervals.

#### Headrope and Footrope

##### **Function**

The headrope and footrope help ensure that the net retains an appropriate shape. In addition, these are used to attach the net to the posts.

##### **Materials Used**

PE rope

##### **Description**

The upper meshes of the net are attached to the headrope. The lower meshes of the netting are attached to the footrope. The headrope and footrope run along the entire length of the net.

## FISH CATCH INFORMATION

Peak Season	Lean Season
<b>Months:</b> November to January	<b>Months:</b> June to August
<b>Ave. catch per day:</b> 4-7 kg	<b>Ave. catch per day:</b> 1-2 kg
<b>No. of fishing days:</b> 9-18 days per month	<b>No. of fishing days:</b> 8-12 days per month

### Dominant Species Caught



Siganidae  
Local name: *Bueawis*



Siganidae  
Local name: *Danggit*



Gobiidae  
Local names:  
*Bagtis, Ibis, Tanga, Uling-uling*



Leiognathidae  
Local name: *Sapsap, Aputoe*



Penaeidae  
Local names: *Pasayan, Batod, Sugpo*



Gerreidae  
Local name: *Batwanon*



Mullidae  
Local name: *Gusaw, Balanak*



Serranidae  
Local name: *Inid*



Scatophagidae  
Local name: *Kilo*

## FISH CATCH INFORMATION



Portunid crabs

Local names  
(clockwise, from top right):

*Kaeantugas,*  
*Alimango,*  
*Kaeantugas,*  
*Kasag*



## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 3,000 to 8,000 pesos</p> <p><b>Who constructs gear?</b> Usually the fisher himself</p> <p><b>Number of days spent on construction</b> 6-7 days</p> <p><b>Frequency and type of maintenance</b> 1-4 times per month Net repair and cleaning</p> <p><b>Number of days spent on maintenance</b> 1-4 days</p>	<p><b>Number of fishers</b> Usually 1-2 persons; Assisted by a family member</p> <p><b>Boat used</b> Usually non-motorized; A few others just walk to their fishing ground</p> <p><b>Time</b> Set barrier net: high tide Retrieve catch: low tide</p> <p><b>Time spent</b> Actual fishing: ~ 0.5 – 2 hours Transport: ~ 30-60 min Sort catch: ~ 30 min</p>

## DESCRIPTION OF FISHING OPERATION

A barrier net is constructed in areas where there is a large fluctuation in water level due to tides. The gear is often erected around mangrove areas. During low tide, the footrope is tied to the bottom part of the posts using a separate PE or PA twine. Meanwhile, the upper half of the net remains unattached to the posts. At high tide, the upper half is raised and the headrope is tied to the bamboo posts using PE or PA twine. To keep the net in contact with the bottom, the footrope is pushed against the bottom.

When water recedes during ebb, the netting panel prevents fish from moving out into the sea. At low tide, trapped fish, crabs, shrimps and other aquatic organisms are collected by picking or scooping. During a fishing operation, the fisher carries the following accessories: ice chest or basket for fish storage, flashlight in case it is dark, and a scoop net for retrieving fish trapped in pools.

Since the use of the gear is tide-dependent, time of fishing operation varies according to the time of flood and/or ebb tide. During neap tide *aya-ay*, barrier net operators do not go fishing. They usually use the period to make net repairs.

# **Chapter 3**

# **Non-Stationary Fishing Gears**

*Harold Monteclaro, Ruby Napata,  
Liberty Espectato and Ramon Cruz*

# POTS

**Local Name: *Panggal, Timing, Bubo***

## At a glance

1. A pot is a passive fishing gear that is made of bamboo and netting. It works by luring target organism into the enclosure.
2. Depending on the design, a pot may have one or more entrances to allow entry of target organisms. The entrance varies in design from a simple slit, a funnel-shaped entrance or a non-return valve.
3. Pots are often used to capture crabs, although it may also be used to catch shrimps and fish. Bait is used to lure these organisms into the pot.
4. The shape of the pot may be circular, rectangular or square.
5. The frame is generally made of bamboo. The netting material is either made up of bamboo or nylon net with mesh size ranging from 1 to 22 mesh. A plastic container or a net serves as bait holder.
6. Pots could be set as a group attached to a mainline or fixed individually through stake. A float (rubber or styrene box) and a sinker (stone or lead) are essential in pot fishing.
7. Around 6-180 pots are used in a single operation which is usually operated by one person. In few instances, pot fishing involves 2-3 persons.
8. Fishing operation typically starts early in the morning (3:00 AM) or mid-afternoon (3:00 PM). Soaking time is generally 10-12 hours.
9. Pots could be operated at any time of the year with peak seasons from March to May and September to December.
10. Average catch during peak season is 2-4 kg crabs and 1-3 kg fish per fishing trip.

## POTS



Pots vary in design and construction materials. (Top) A rectangular-shaped *panggal* made of wooden frame and PE netting with a pair of slit openings at the side. (Middle) A square-shaped *panggal* made of bamboo and PE netting with a pair of slit openings at the opposing sides. (Bottom) A frustum *panggal* constructed using bamboo and PE netting with a single opening at the top.

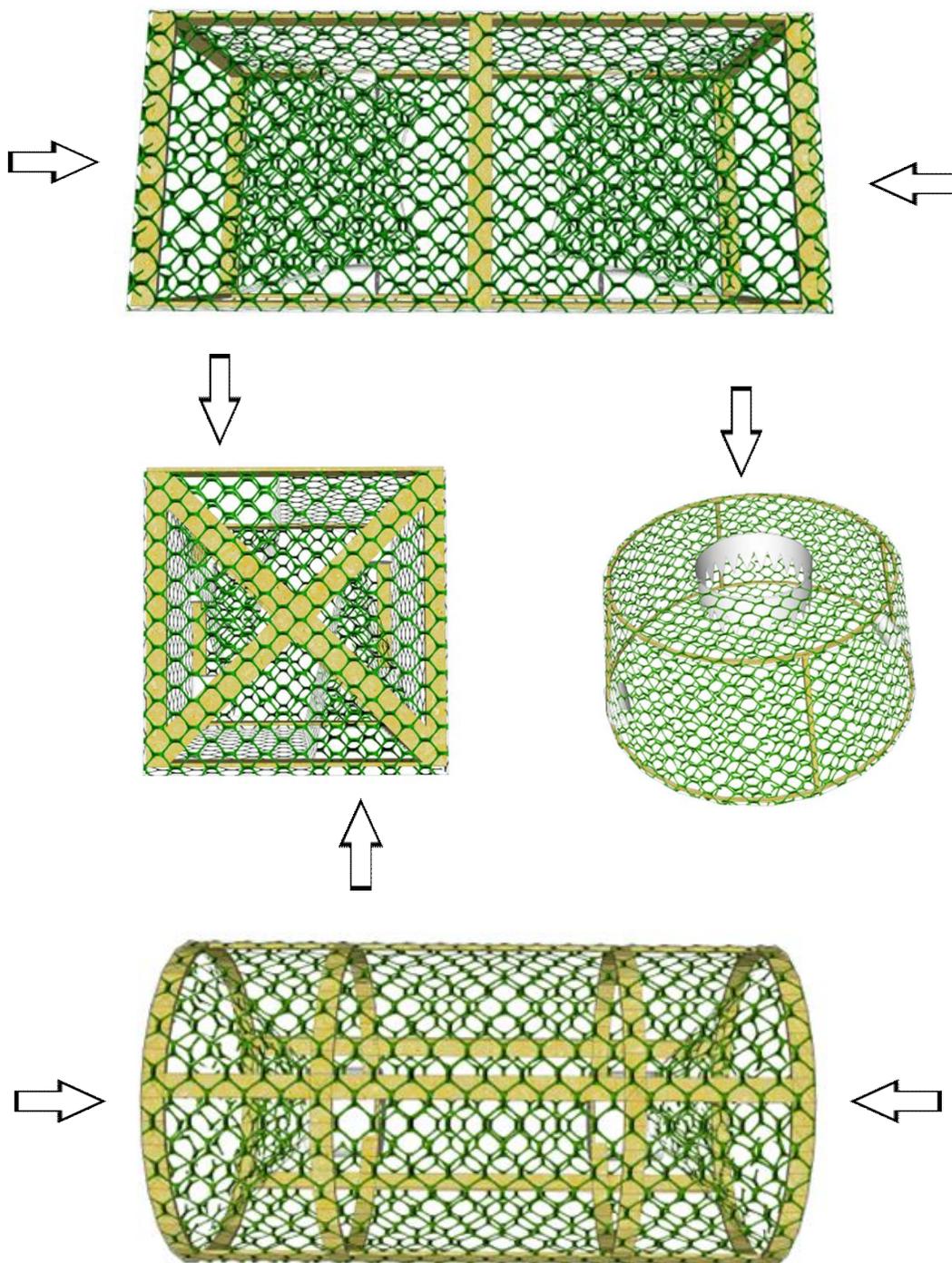
## POTS



(Top, Left) A cylindrical *panggal* made of bamboo frame and PA netting with a single opening at the side. (Top, Right) A rectangular-shaped *panggal* made of bamboo and PE netting with a pair of non-return valves at the opposite sides. (Middle) Cylindrical *panggal* made of bamboo slats. (Bottom) A *bubo* constructed using bamboo with a single non-return valve at the side. A *panggal* usually catches crabs, fish and shells while a *bubo* usually catches bigger-sized fish.

## GEAR DESCRIPTION

### Parts of a Pot



Pot designs vary in shape, construction materials and entrance. Arrows indicate position of entrance according to design.

## GEAR DESCRIPTION

### Parts of a Pot

#### Frame

<b>Function</b>	<b>Material Used</b>
The frame provides shape to the gear and serves as attachment for the net, bait holder, sinkers and retrieving line.	Wood or bamboo slats

#### **Description**

The frame of a pot varies in shape (circular, rectangular or square). The bamboo slats or wooden frames are joined using PA or PE twine. A *panggal* is a small-sized fishing gear with sizes that range from 62-66 cm x 15-32 cm x 21-54 cm (L x W x H). In contrast, a *bubo* is large-sized, often at 1.5 m x 1.5 m x 1.5 m.

#### Netting

<b>Function</b>	<b>Materials Used</b>
The net is used to enclose the frame to trap fish or crab that has entered the pot.	Either plastic chicken wire, PE, PA or bamboo slats

#### **Description**

The netting material is attached to the frame using PA or PE twine. Mesh size of the net ranges from 1-22 cm.

#### Entrance

<b>Function</b>	<b>Materials Used</b>
The entrance allows a fish or crab to enter the pot. It also serves as an exit.	Either PE or PA net, plastic chicken wire, or a plastic container.

#### **Description**

The entrance varies in design from a simple slit, funnel-shaped or one-way valve.

## GEAR DESCRIPTION

### Parts of a Pot

<b>Bait holder</b>	
<b><i>Function</i></b>	<b><i>Material Used</i></b>
Holds the bait; ensures that bait is kept in place.	Either perforated plastic container, bamboo or a net-pouch

#### ***Description***

The bait holder is attached inside the pot, either at the bottom, center or upper portion of the gear. It is tied to the frame using PA or PE twine. Common materials used as bait are small fish (e.g., gobies, slipmouths, ambassids, etc), small crabs and shrimps and shells.

<b>Float and Retrieving Line</b>	
<b><i>Function</i></b>	<b><i>Material Used</i></b>
The retrieving line is used to pull the pot to the surface. The float marks the site where the fishing gears are set.	PE rope, 4 mm diameter Float: Empty plastic container, polystyrene, or Bamboo, 1 pc

<b>Sinkers</b>	
<b><i>Function</i></b>	<b><i>Material Used</i></b>
Sinkers are used to keep the gear submerged to the bottom.	Lead sinker or stone, 1-4 pcs Bamboo stick (if pot is staked into the substrate)

#### ***Description***

Sinkers are attached inside the pot, usually at the corners, using PA or PE twine. Each sinker may weigh about 0.25 to 0.60 kg. In few cases, the pot is secured firmly in place using a bamboo stick.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	March to May; Sep to Dec	<b>Months:</b>	June to August
<b>Ave. catch per day:</b>	2-4 kg	<b>Ave. catch per day:</b>	1-1.6 kg
<b>No. of fishing days:</b>	23-27 days/month	<b>No. of fishing days:</b>	16-22 days/month

### Dominant Species Caught



Portunidae  
Blue swimming crab  
Local name: *Kasag*



Batrachoididae  
Toadfishes  
Local name: *Ugok*



Penaeidae  
Shrimps  
Local name: *Batod*



Portunidae  
Mud crab  
Local name: *Alimango*

## FISH CATCH INFORMATION

### Examples of Other Species Caught



Various crabs



Squillae  
Mantis shrimps  
Local name: *Pitik-pitik*

Nassariidae  
Sea snails  
Local name: *Tamisan*



Palaemonidae  
Freshwater shrimp  
Local name: *Ulang*



Serranidae  
Groupers  
Local name: *Inid*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 41 to 60 pesos</p> <p><b>Who constructs gear?</b> Mostly by fisher himself</p> <p><b>Number of days spent on construction</b> A skilled person can construct 10-20 units in a day.</p> <p><b>Frequency of maintenance</b> Usually once a week</p> <p><b>Number of days spent on maintenance</b> 1/2 day</p> <p><b>Type of maintenance</b> Net mending, cleaning, frame replacement</p> <p><b>Gear usage</b> A pot may be used for 3 years as long as it is used and maintained properly.</p>	<p><b>Number of fishers:</b> Usually one person</p> <p><b>Boat used:</b> Usually non-motorized</p> <p><b>Time pot is set</b> Usually around 3:00 to 4:00 in the afternoon; sometimes around 3:00 AM</p> <p><b>Time pot is retrieved</b> Around 4:00 to 5:00 AM (if set late afternoon) Around 3:00 PM (if set early morning)</p> <p><b>Soaking time</b> Usually 12 hours</p> <p><b>Total time spent fishing:</b> ~ 4-7 hrs</p> <p><b>Accessories used</b> Flashlight Scoop net</p>

## DESCRIPTION OF FISHING OPERATION



A pot lures fish or crab using bait. Commonly used bait materials are small fish, crabs and shells that are caught by stationary fishing gears such as *tigbaco*, *tangab* or *saluran*. The bait is chopped and placed in a netting pouch (left) or inside perforated plastic containers (right). Fishing operation is highly dependent on availability of bait. During days when operators of *tigbaco*, *tangab* or *saluran* stop fishing because of slow to moderate tidal currents, the supply of bait materials decreases thus price of bait increases. The increase in bait prices often prompt pot fisher to suspend fishing operations.



Pot fishing often involves the use of about 50-200 units *panggal*. These gears are often stacked on the boat's outriggers in order to save space.

A *panggal* fisher usually conducts fishing by himself. Before leaving to set the pots, the pots have already been baited. The pots may be set individually or as a series with a mainline. A float is attached at both ends of the mainline to serve as marker. After setting the pots, the fisher returns home. Soaking time is about 12 hours. He returns to the site where he had set the pots and hauls the units back to the boat. After retrieval, he returns home.

At the landing area, he carries the fishing gears back to his house where catch is taken out from the *panggal*. With the aid of family members, catch is sorted, weighed and sold to middlemen.

# CRAB LIFT NET

Local Name: *Bintol*

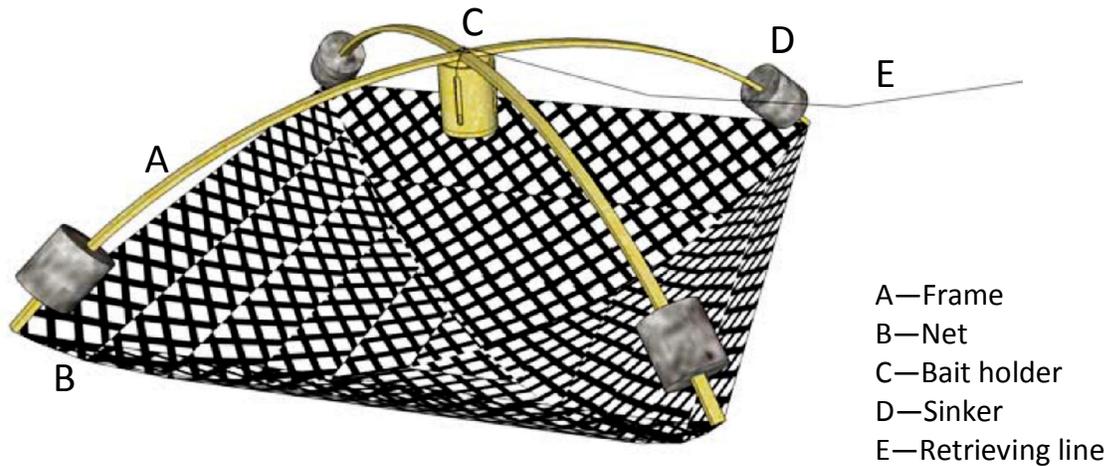


## At a glance

1. A *bintol* is a passive fishing gear used mainly to trap crabs. It is composed of a bamboo frame and netting material.
2. To lure crabs, the gear is baited with chopped fish. The bait is placed inside a bait holder made of bamboo.
3. Usually there is only one person performing the fishing operation. A fisher usually employs about 30 units *bintol* per operation.
4. Fishing operation is performed at high tide. Fishing is conducted early morning or late afternoon. Each fishing operation normally lasts for 4 hours.
5. A *bintol* costs PhP 21-24 per unit.
6. A *bintol* has a simple design and is easy to construct. The fisher usually makes his own *bintol*. A skilled fisher can construct about 20-30 units *bintol* in an hour.

## GEAR DESCRIPTION

### Parts of a *Bintol*



#### Frame

<i><b>Function</b></i>	<i><b>Material Used</b></i>
The frame provides shape to the gear and serves as attachment for the net, bait holder, sinkers and retrieving line.	Bamboo slats, 2 pcs

**Description**

Each slat is about 60-70 cm long and 1-2 cm wide. The two slats are joined at the center using PA or PE twine for tying.

#### Weights

<i><b>Function</b></i>	<i><b>Material Used</b></i>
Sinkers are used to keep the gear at the substrate.	Lead sinker or stone, 4-8 pcs

## GEAR DESCRIPTION

### Parts of a *Bintol*

#### Weights

##### **Description**

Sinkers are attached at the tips of the bamboo frame using nylon twine.

#### Netting

##### **Function**

The net is used to entangle crab as the gear is lifted to the surface.

##### **Materials Used**

Netting panel  
Material: PA  
Dimensions: ~ 0.57 -0.64 m  
Mesh size: ~6 cm

##### **Description**

The sheet of netting has a square shape. Each corner of the netting is attached to one end of the bamboo slat. A nylon twine is used to tie the netting to the bamboo frame.

#### Float and Retrieving Line

##### **Function**

The retrieving line is used to pull the *bintol* to the surface. The float marks the site where the fishing gears are set.

##### **Material Used**

PE rope, 4 mm diameter  
Float: Empty plastic container, styropor, or Bamboo, 1 pc

#### Bait holder

##### **Function**

Holds the bait; ensures that bait is kept in place.

##### **Material Used**

Empty plastic container or bamboo, 1 pc

##### **Description**

The bait holder is attached at the point where the two bamboo slats are joined together. It is tied to the bamboo frame using PA or PE twine.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	March to May; Sep to Dec	<b>Months:</b>	June to August
<b>Ave. catch per day:</b>	2-4 kg	<b>Ave. catch per day:</b>	0.9-1.6 kg
<b>No. of fishing days:</b>	12-25 days per month	<b>No. of fishing days:</b>	10-22 days per month

### Dominant Species Caught



*Portunus pelagicus*  
Blue swimming crab  
Local name: *Kasag*



*Charybdis feriatus*  
Crucifix crab  
Local name: *Kurusan*

### Examples of Other Species Caught



*Scylla* sp.  
Mangrove crab  
Local name: *Alimango*



*Thalamita crenata*  
Crenate crab  
Local name: *Kaeantugas*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 21-24 pesos</p> <p><b>Who constructs gear?</b> Fisher himself</p> <p><b>Number of days spent on construction</b> 2-3 days</p> <p><b>Frequency of maintenance</b> Usually once a week</p> <p><b>Number of days spent on maintenance</b> 1/2 day</p> <p><b>Type of maintenance</b> Net mending, cleaning, frame replacement</p>	<p><b>Number of fishers:</b> Usually one person</p> <p><b>Boat used:</b> Usually non-motorized</p> <p><b>Time start fishing</b> Fishing is conducted during flood tide, preferably in the morning.</p> <p><b>Total time spent fishing:</b> ~ 4-7 hrs</p>

A crab lift net is operated in shallow waters. This allows fisher to use a non-motorized boat to conduct fishing.

*Bintol* fishing is conducted during a flood tide, that is, when water level is rising. It is during this period when crabs often go out from their shelters to go feeding. *Bintol* operators often prefer to conduct fishing operations when flood tide occurs at daytime, although they may also go fishing when flood tide starts early morning.

## DESCRIPTION OF FISHING OPERATION



*Bintol* fishing is often conducted by a single fisher aboard a non-motorized boat. During fishing operation, the fisher normally sets 15-30 units *bintol*.

Upon reaching the fishing ground, the *bintol* fisher places bait into the bait holder. Common materials used as bait are fish with low commercial value such as juvenile fishes or eel. Some fishers use frog as bait. The bait holder is attached at the center of the bamboo slat using nylon twine. The *bintol* is then set to the bottom. A float is attached in each *bintol* to serve as marker that allows the fisher to easily identify the site where the gear was set. He usually sets the baited gears in a circular or rectangular pattern for easy retrieval.

Soaking time is around 20-30 minutes. Hauling the gear requires some amount of skill as the crabs may swim away while the gear is being retrieved. When fishing operation is performed early morning while it is still dark, a flashlight is used for lighting. The captured crabs are placed in a bucket. The same fishing procedure is repeated as long as there is enough bait material left for use. The entire fishing procedure may last for 4 hours.

# GILLNETS

Local Name: *Panti, Pukot*

## At a glance

1. The basic component used in gillnet construction is a “wall” or panel of meshes made of nylon. The panel is reinforced on all sides using twine.
2. Gillnets used inside an estuary widely vary in design and use. They may either be set near the surface or at the bottom. They could be set, fixed or allowed to drift with the current. The differences mainly result from the type of fish being targeted by the fisher.
3. To maintain the net shape when soaked underwater, floats and sinkers are fastened at regular intervals to the floatline and sinkerline, respectively. Another gillnet variety is kept in position using bamboo stakes.
4. Fishing operation varies according to gillnet variant. Some gillnets are operated daytime, others are used at night.
5. Soaking time varies according to type of gillnet variant. It may range from an hour to one whole night.
6. In one variant (i.e., *pamanti sibot*), a fisher creates noise by striking the water surface with a pulse stick. This is believed to surprise fish and make it swim erratically until it gets gilled.
7. Some gillnet variants target specific species such as crabs, shrimps or mullets. Other species caught include rabbitfishes, goatfish, slipmouths and other estuarine fishes.
8. Fishing operation usually involves two persons. The assisting person is usually the fisher’s son or wife.
9. Boats used may either be motorized or non motorized.
10. The cost of the gear varies according to length of gillnet to be constructed.

# GILLNETS

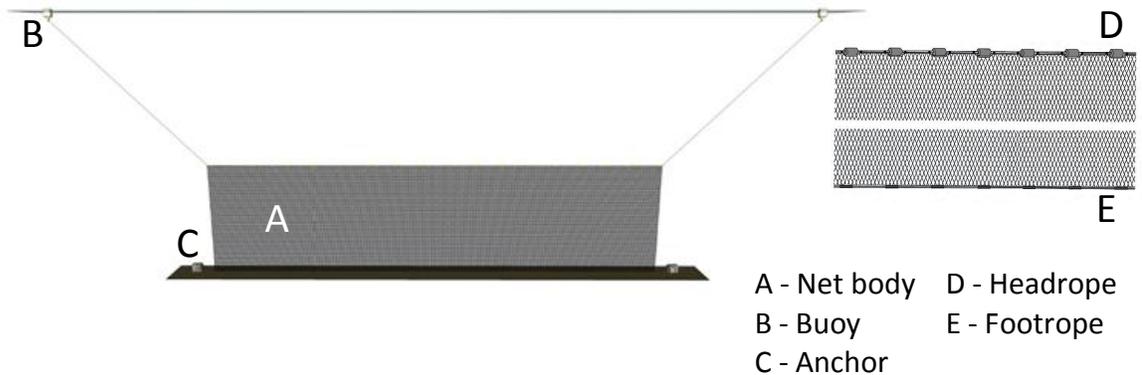


## GILLNET VARIANTS

Type	Local Name	Target Species
Surface drift	Palutaw	Mulletts
Encircling	Pamanti-Sibot	Rabbitfishes
Bottom drift	Pakalot	Penaeids
Bottom set	Palugdang	Siganids, crabs, demersals
	Pamanti-ibis	Slipmouth
Crab entangling	Pangkasag	Crabs
Bottom fixed	Patuloy, harang	Crabs, penaeids, rabbitfishes

## GEAR DESCRIPTION

### Parts of a *Panti*



#### Net Body (Netting)

**Function**

The netting acts like a wall that captures fish that tries to pass through the invisible net.

**Materials Used**

Nylon (PA), 1 ply  
 Mesh opening  
 Encircling: Usually 7 cm  
 Bottom-set: Usually 7 cm  
 Crab entangling: Usually 8 cm  
 Diameter  
 Encircling: 0.20 mm  
 Bottom set and crab entangling: 0.15 mm

**Description**

The length of the gillnet ranges from 150-300 m (encircling net), about 200 m (bottom set gillnet), or about 100 m (crab entangling net). Net height is usually 50 meshes (encircling and bottom set gillnet) or 16 meshes (crab entangling net).

#### Headrope

**Function**

The headrope gives the net its shape. It also provides attachment for the floats.

**Materials Used**

Material: PE  
 Size: Usually No. 4  
 Diameter: 2.2 mm

**Description**

Gillnets in the estuary have two pieces twine as headrope. The first twine is where the netting is hung. The second twine or the floatline is where the floats are attached. Both lines are joined together using PE or PA twines.

## GEAR DESCRIPTION

### Parts of a *Panti*



The floatline with rubber floats attached.      The sinkerline with lead sinkers.

<b>Footrope</b>	
<p><b>Function</b></p> <p>The footrope gives the net its shape. It also provides attachment for the sinkers.</p>	<p><b>Materials Used</b></p> <p>Material: PE Size: Usually No. 4 Diameter: 2.2 mm</p>

**Description**

Gillnets in the estuary have two pieces twine as footrope. The first twine passes through the lower meshes of the net. The second twine or the sinkerline is where the sinkers are attached. Both lines are joined together using PE or PA twines.

<b>Floats</b>	
<p><b>Function</b></p> <p>The floats provide buoyancy to the net.</p>	<p><b>Materials Used</b></p> <p>Cut-out rubber (7x2x1 cm)</p>

**Description**

The floats are attached to the floatline using PA. The interval between each rubber float is about 60-70 cm (encircling) or 50-110 cm (bottom set and crab entangling).

## GEAR DESCRIPTION

### Parts of a *Panti*

Sinkers	
<b>Function</b>	<b>Materials Used</b>
The sinkers ensure that the net opens vertically underwater.	Lead, cylindrical (44.3x7.3 mm)
<b>Description</b>	
The cylindrical lead sinkers are attached to the sinkerline. A cylindrical sinker is hollow at the center to allow the sinkerline to pass through. The sinker is further tied in place using PA twine. The interval between each sinker is about 18-22 cm (encircling gillnet) or 25-45 cm (bottom set and crab entangling net).	



A typical buoy used in the Philippines is an empty plastic bottle (left). The anchors used in a gillnet are ~1-kg stones tied with PE rope (right).

Buoys and Markers	
<b>Function</b>	<b>Materials Used</b>
The buoys are usually used to mark the site where the net is deployed.	Empty plastic bottle, 2 pcs. Bamboo pole, 2 pcs Sack, nylon cloth or tarpaulin
<b>Description</b>	
Each buoy is attached to each end of the headrope. Attached to a buoy is a marker to easily identify the presence of a submerged fishing gear. The marker is usually made of a colored nylon cloth, sack or tarpaulin that is fixed on a short pole which in turn is tied to the buoy to keep the marker erect.	

## GEAR DESCRIPTION

### Parts of a *Pamanti Sibot*

#### Anchors

<b><i>Function</i></b>	<b><i>Materials Used</i></b>
The anchors keep the net firmly in place.	Stone, 2 pcs.

***Description***

Two pieces of stone, weighing about 0.5-1 kg each, are often used as anchors. The anchors are attached to each end of the footrope.

#### Pulse Stick (*Tumbok*)

<b><i>Function</i></b>	<b><i>Materials Used</i></b>
The pulse stick is used by fisher to create sound while fishing. It is said to drive fish into the gillnet.	Bamboo (for handle) Coconut husk or bamboo (for banger)

***Description***

The fisher strikes the water surface using the pulse stick to create sound. As his companion paddles or maneuvers the boat forward, the fisher continues to pound the water surface. The pulse stick is used in an encircling gillnet (*pamanti sibot*) operation.



The pulse stick is composed of a handle (made of bamboo) and a banger (made of bamboo, coconut husk, or any other appropriate material).

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	February to May	<b>Months:</b>	July to November
<b>Ave. catch per day:</b>	3-5 kg	<b>Ave. catch per day:</b>	1-3 kg
<b>No. of fishing days:</b>	24-28 days/month	<b>No. of fishing days:</b>	18-24 days/month

### Dominant Species Caught



Portunidae  
Blue swimming crabs  
Local name: *Kasag*

Siganidae  
Rabbitfish  
Local name: *Bueawis, Danggit, Mubead*



Mugilidae  
Mullet  
Local name: *Gusaw, balanak*

Gerreidae  
Mojarra  
Local name: *Batwanon*



Leiognathidae  
Slipmouth  
Local name: *Sapsap*



Nassariidae  
Sea snail  
Local name: *Tamisan*



Penaeidae  
Tiger prawn  
Local name: *Sugpo*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b>                      Encircling: 4,000 to 5,000 pesos                      Bottom set: ~5,000 pesos                      Crab entangling: ~3,000 pesos</p> <p><b>Who constructs?</b>                      Usually by fisher himself</p> <p><b>Number of days spent on construction</b>                      2-7 days</p> <p><b>Frequency of maintenance</b>                      Every week to once a month</p> <p><b>Number of days spent on maintenance</b>                      1 day</p> <p><b>Type of maintenance</b>                      Net repair, cleaning</p> <p><b>Who performs maintenance?</b>                      Mostly by fisher himself, assisted by family members</p>	<p><b>Number of fishers: 2</b></p> <p><b>Who helps in the fishing operation:</b>                      A family member;                      Usually the wife or son</p> <p><b>Boat used:</b> Usually non motorized</p> <p><b>Encircling Gillnet</b>                       Time fishing starts: Before sunrise                      Time spent for one operation: ~15 min                      Fishing operation: 5:00 AM-12:00 PM                      Time finished fishing: Around noon                      Total time spent fishing: ~ 8 hrs</p> <p><b>Bottom set Gillnet and Crab Entangling Net</b>                       Time net is set: Late afternoon                      Time net is retrieved: Before sunrise</p>

## DESCRIPTION OF FISHING OPERATION



Fishing using an encircling gillnet. One member rows the boat from one end to another end of the net that has been set. The second member bangs the water surface using a pulse stick.

### **Fishing using an Encircling Gillnet**

An encircling gillnet is set in shallow water. The net spans the entire water depth from the surface to the bottom. A small boat is used to set the net with two or more fishers onboard. The fishers often encircle a stationary structure such as an oyster culture area where fish tends to aggregate.

Once the entire net has been set, one of the fishers onboard bangs the water surface using a pulse stick (locally called *tumbok*) while the other fisher rows the boat from one end to another end of the net. The splashing of the water surface is believed to scare fish so that they are gilled or entangled. Thereafter, the net is manually hauled onboard the boat. A single fishing operation may take 15-20 minutes.

After an operation, the fishers set their net in another area and repeat the fishing cycle. The entire fishing operation may last 6-8 hours in a day to catch a good amount of fish.

## DESCRIPTION OF FISHING OPERATION

### Fishing using a Crab Entangling Gillnet

The crab gillnet is set at the bottom before sunset. Fishing operation is normally conducted by two persons. One person sets the net while the other person rows the boat. In setting the net, one of the anchors is released followed by one end of the net. The netting is arranged aboard the boat in such a way that as the boat moves forward, the net is slowly released. This procedure normally takes about 10-15 min. After the entire net has been set, the buoy is attached to the end of the headrope.

Soaking time is often overnight. Early the next day, the fisher returns to the area where he had set the net. He initially retrieves the buoy and slowly hauls the net by hand. While retrieving the gear, he removes entangled crab from the net. This is done to prevent entanglement of the netting. Sometimes, the net is torn especially when crab is difficult to remove from entanglement. When they have reached the landing area and with the catch sent to the buyers, the fisher arranges the net to ensure easy setting during the next operation.



Gillnets that are soaked and left overnight need to be marked. To do this, local fishers attach a kerosene lamp to the buoy. The kerosene lamp is kept afloat by placing it atop a small bamboo raft. The lamp is lighted to warn other fishers that a gillnet has been set in the area. It also allows the fisher to easily identify the area of the submerged gear when he returns the next day.

## DESCRIPTION OF FISHING OPERATION



A fisher hauling a gillnet

### Fishing using a Bottom-set Gillnet

A *pantihan palugdang* is a gillnet type that is set at the bottom. The net is set late afternoon. Fishing operation is normally conducted by two persons. One person sets the net while the other person rows the boat. In setting the net, one of the anchors is released followed by one end of the net. The netting is arranged aboard the boat in such a way that as the boat moves forward, the net is slowly released. This procedure normally takes about 10-15 min. After the entire net has been set, the buoy is attached to the end of the floatline.

Soaking time is often overnight. Early the next day, the fisher returns to the area where he set the net. He initially retrieves the buoy and slowly hauls the net by hand. While retrieving the gear, he removes gilled fish or debris that may be entangled in the net. Once the net has been completely hauled, the fishers return to their landing site where he arranges the net to ensure easy setting during the next operation.

# TRAMMEL NET

Local Name: *Pakalot*



## At a glance

1. The trammel nets used in the New Washington-Batan estuaries are composed of two nettings joined together at the headrope and footrope.
2. The two netting panels have different mesh openings – one has a larger mesh size than the other.
3. There are two trammel net variants in these estuaries. The first variant is a bottom drift trammel net, locally called *pakalot*. The second variant is a bottom set trammel net, locally called *palubog*.
4. A *pakalot* primarily targets penaeid shrimps while the *palubog* targets rabbitfishes, spotted scats and slipmouths.
5. A *pakalot* does not have anchors to allow the net to drift with the water current.



## GEAR DESCRIPTION

### Parts of a *Pakalot/ Palubog*

#### Headrope

<b><i>Function</i></b>	<b><i>Materials Used</i></b>
<p>The headrope 1) helps ensure that the net maintains its appropriate shape, 2) provides attachment for the floats, and 3) joins the two nettings into one fishing gear.</p>	<p>PE                      Size: Usually No. 4                      Diameter: 2.2 mm</p>

***Description***

A trammel net has three pieces twine that form the headrope. The first and second twines are where the uppermost meshes of the two nettings are hung. The third twine is the floatline where the floats are attached. Finally, all lines are joined together using PA twine.

#### Footrope

<b><i>Function</i></b>	<b><i>Materials Used</i></b>
<p>The footrope 1) helps ensure correct net shape, 2) provides attachment for the sinkers so that the net opens vertically underwater, and 3) joins the two nettings into one fishing gear.</p>	<p>PE                      Size: Usually No. 4 or 5                      Diameter: 2.2. mm</p>

***Description***

A trammel net has three pieces twine that form the footrope. The first and second twines are passed through the lowermost meshes of the two nettings. The third twine is the sinkerline where the sinkers are attached. Finally, all lines are joined together using PA twine.

## GEAR DESCRIPTION

### Parts of a *Pakalot/ Palubog*

<b>Floats</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
The floats provide buoyancy to the net.	Cut-out rubber (5x2x1.5 cm)
<b><i>Description</i></b>	
The floats are tied into the floatline using PA. The interval between each rubber float is about 100 cm, although this may range from 50-100 cm.	
<b>Sinkers</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
The sinkers ensure that the net opens vertically underwater.	Lead
<b><i>Description</i></b>	
The lead sinkers are attached to the sinkerline using PA. The interval between each sinker is about 30 cm, although it may range from 25 to 45 cm.	
<b>Buoys and Anchors</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
The buoys are usually used to mark the site where the net is deployed. The anchors ensure that the gear is set in place (for the <i>palubog</i> only).	Buoy: Empty plastic bottle, 2 pcs 1 m bamboo pole. 2 pcs Flag made of plastic, 2 pcs Buoyline: PE Anchor: Stones, 2 pcs, 0.5-1 kg each Anchorline: PE
<b><i>Description</i></b>	
A buoy is composed of a plastic flag attached to a bamboo pole which in turn is tied to an empty plastic bottle to keep the pole erect and afloat. Each buoy is attached to both ends of the headrope. Similarly, each anchor is attached to the both ends of the footrope.	

## FISH CATCH INFORMATION

### Dominant Species Caught



Penaeidae  
Tiger prawn  
Local name: *Sugpo*



Penaeidae  
Greasyback shrimp  
Local name: *Batod*



Leiognathidae  
Slipmouths  
Local name: *Sapsap*



Portunidae  
Blue swimming crabs  
Local name: *Kasag*



Siganidae  
Rabbitfishes  
Local name: *Bueawis, Danggit, Mubead*



Scatophagidae  
Scats  
Local name: *Kilo, Kikiro*



Gerreidae  
Mojarras  
Local name: *Batwanon*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 5,000 pesos</p> <p><b>Who constructs?</b> Usually by fisher himself</p> <p><b>Number of days spent on construction</b> 2-7 days</p> <p><b>Maintenance</b> 1 day, every week to once a month Net repair, cleaning</p>	<p><b>Number of fishers:</b> 2</p> <p><b>Who helps in the fishing operation:</b> A family member such as wife or son</p> <p><b>Boat used:</b> Usually non motorized</p> <p><b>Time start fishing</b> When there is ebb or flood tide</p> <p><b>Time spent during each fishing trip</b> Traveling: ~ 1 hours Fishing: 4-6 hours Total time spent fishing: ~5-7 hours</p>

### DESCRIPTION OF FISHING OPERATION

A trammel net is tide dependent. It is best used when there is a strong water current present in the estuary. The trammel net is set and hauled manually. The shrimps, crabs and fish are entangled in a pocket of small mesh webbing between the two layers of netting. Common catch are bottom-dwelling species such as shrimps, tiger prawn, crabs, rabbitfishes and slipmouths.

A *pakalot* is set in waters about 5-10 m deep during ebb or flood tide. The net is allowed to drift for about 1 hour before retrieval. The catch is taken off the net and the gear is once again set. Fishing operation may take 4-6 hours depending on the tidal cycle and water current.

A *palubog* is often set during high tide to reduce net damage because of boat navigation. After 4-6 hours, the fisher returns to the submerged gear and begins to retrieve the net.

# DRIVE-IN NET

Local Name: *Ugnat*

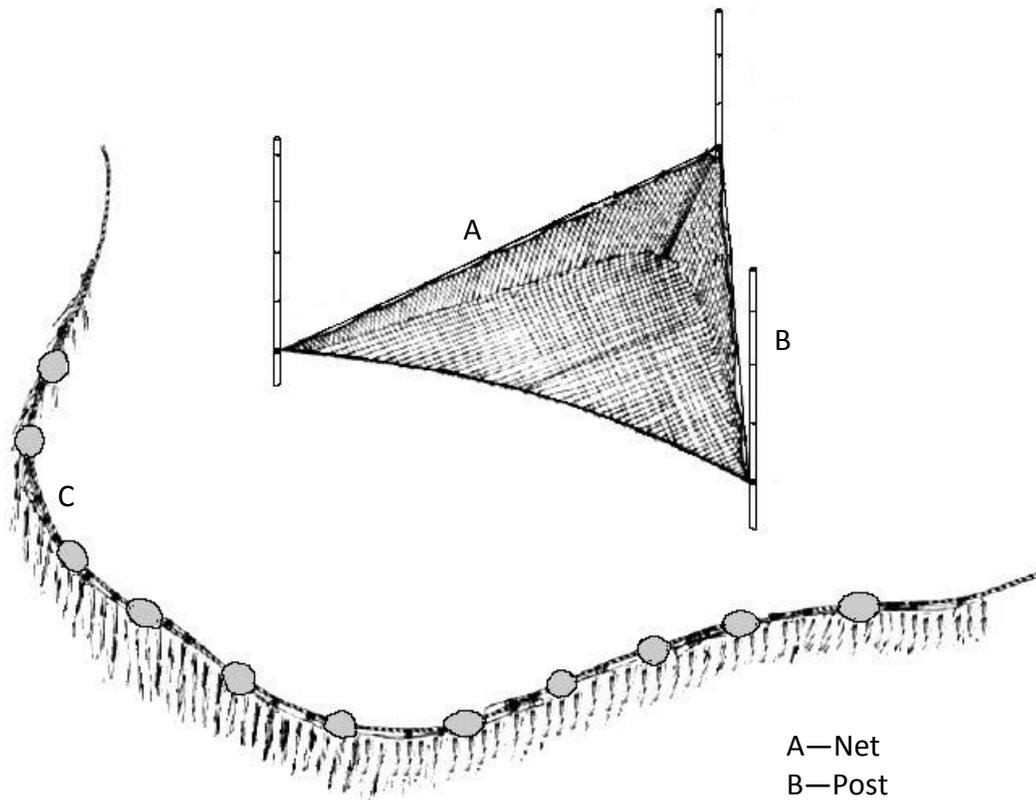
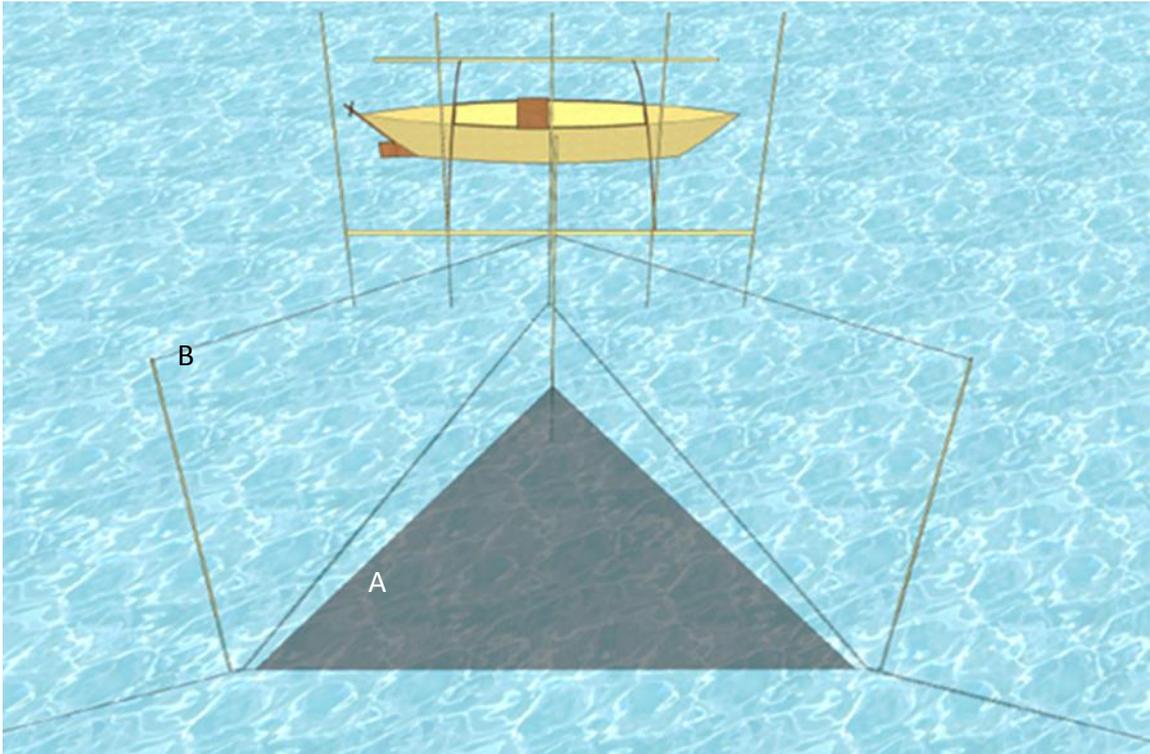


## At a glance

1. A drive-in net is an active fishing gear which employs a scareline that herds fish towards a netting.
2. The primary target species of *ugnat* are gobies. Other species caught are crabs, slipmouth and shrimps.
3. Fishing operation is usually conducted by a single person.
4. Peak season of *ugnat* is from September to December. Lean season is from March to August.
5. Average catch varies from 7 kg during peak season to 2 kg during lean season.
6. Construction cost is about 2,000 pesos. The longer the net, the higher the construction cost becomes.

## GEAR DESCRIPTION

### Parts of an *Ugnat*



A—Net  
B—Post  
C—Scareline

## GEAR DESCRIPTION

### Parts of an *Ugnat*

#### Net

<b>Function</b>	<b>Materials Used</b>
The net traps the fish.	HDPE Raschel net, knotless May also use Kuralon, PE, PA Netting number: No. 22 Skirtline: PE

**Description**

The triangular-shaped net is about 2 m high and 4 m long. The skirtline maintains the shape of the net.

#### Bamboo Posts

<b>Function</b>	<b>Bamboo Used</b>
The posts serve as attachment for the net and scareline.	Type: 3 <sup>rd</sup> class Quantity: 3-5 pcs

**Description**

The bamboo posts are staked about 0.5 m into the substrate. The posts are placed in each corner of the triangular-shaped net.

#### Scareline

<b>Function</b>	<b>Materials Used</b>
The scareline drags the substrate and herds fish into the waiting net.	Line Material: PE Line Number: No. 20 (mode) Length: 200 m (mode) Plastic strips: usually plastic (may use <i>huri</i> , sack, or combination) Length of plastic strips: 30 cm (mode)

**Description**

The scareline is composed of a mainline (usually PE and 200 m long) and plastic strips (30 cm long) that are spaced at about 30 cm interval.

## FISH CATCH INFORMATION

Peak Season		Lean Season	
<b>Months:</b>	Sep to Dec	<b>Months:</b>	Mar to Aug
<b>Ave. catch per day:</b>	6-7 kg	<b>Ave. catch per day:</b>	1-3 kg
<b>No. of fishing days:</b>	25 days per month	<b>No. of fishing days:</b>	21 days per month

### Dominant Species Caught



Gobiidae

Gobies

Local name: *Tanga*

### Examples of Other Species Caught



Leiognathidae

Slipmouths

Local name: *Sapsap*,  
*Aputoe*



Portunidae

Blue crab

Local name: *Kasag*



Penaeidae

Shrimps

Local name: *Batod*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 2,000 pesos Larger nets cost more</p> <p><b>Who constructs gear?</b> Fisher himself, assisted by family members</p> <p><b>Number of days spent on construction</b> 5-6 days</p> <p><b>Frequency of maintenance</b> Usually once a month</p> <p><b>Number of days spent on maintenance</b> 1-2 days</p> <p><b>Type of maintenance</b> Net repair and cleaning</p>	<p><b>Number of fishers</b> Usually one person Sometimes assisted by a son or another family member</p> <p><b>Boat used</b> Usually non-motorized Some use motorized boats A few others just walk to their fishing ground</p> <p><b>Time</b> Leaves house: dawn or early morning Finish fishing: ~ 10:00-11:00 AM</p> <p><b>Time spent</b> Actual fishing: ~ 4-5 hours Transport: ~ 30-60 min Sort catch: ~ 30 min Total time spent fishing: ~ 4-6 hrs</p>

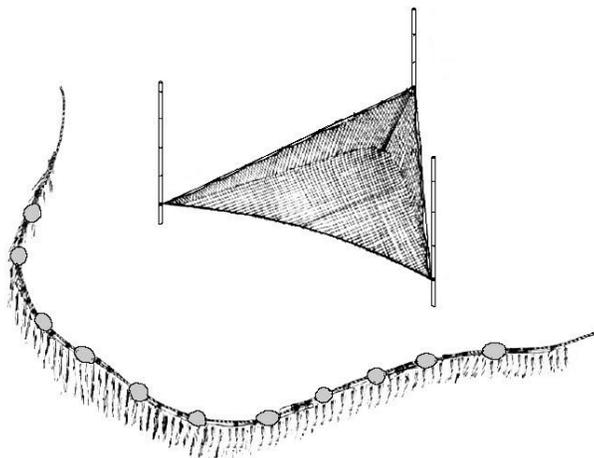
### Fishing Accessories

Item	Function
Scoop net	To scoop fish from net
Ice chest/ Bucket/ <i>Buri</i> basket	To temporarily store caught fish
Flashlight or kerosene lamp	For illumination (if fishing is conducted early morning)

## DESCRIPTION OF FISHING OPERATION

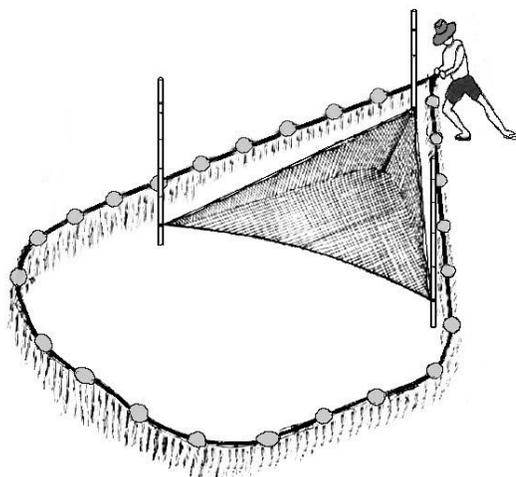
*Ugnat* fishing is conducted at daytime and during low tide. The fisher decides which area he will go fishing and travels to the fishing ground aboard a boat, although some fishers choose to conduct fishing near their home so that a boat becomes unnecessary.

The fisherman initially stakes three bamboo posts. Each side of the triangular-shaped net is attached to a bamboo post to keep the net stationary. The fisher sets the scareline in a semi-circular manner about 50-100 m from the net. He then pulls both ends of the scareline from behind the net. As the fisher pulls the scareline towards the net, the area enclosed by the scareline decreases. When the rest of the scareline reaches the mouth of the net, the fisherman lifts the bottom of the net to trap fish. Fish is scooped from the net and placed in buckets or containers. The *ugnat* fisher repeats the same fishing process as long as the water depth does not exceed chest high.



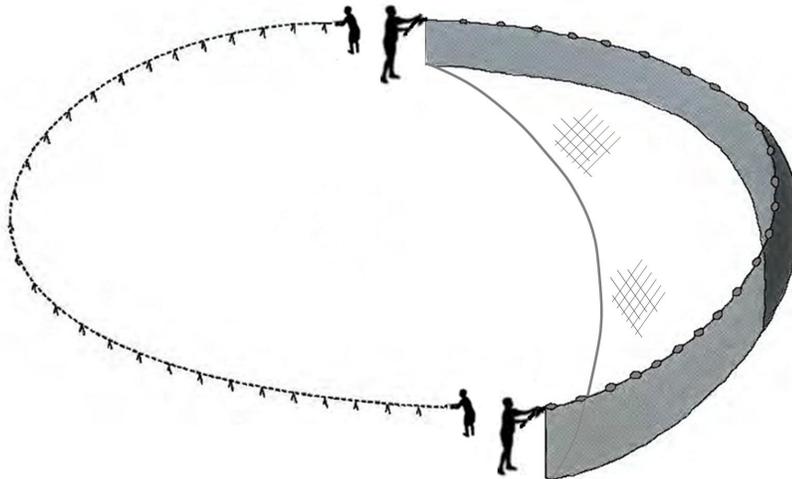
*Ugnat* fishing is an active fishing gear. The fish is herded towards the waiting net using a scareline. The scareline is made of plastic strips tied to a PE line.

This fishing gear is used in the midstream areas of the estuary that have muddy substrates.



# DRIVE-IN NET

Local Name: *Sigbi*



## At a glance

1. A *sigbi* is another type of a drive-in net.
2. The primary target species are mullets.
3. Fishing operation employs 4-5 persons aboard a motorized boat.



4. The gear has two principal components - a net body and a scareline.
5. The net body is about 20-30 m long. A netting panel that serves as a bottom covering is attached to the footrope.
6. The net is held in place by 2-3 persons.
7. The scareline is a PE rope where coconut fiber is attached at an interval of about 1 meter.
8. Two other persons hold the scareline and as they move towards the net the moving scareline herds fish towards the waiting net.
9. When the scareline meets the net body, the bottom of net is raised to trap fish.
10. Each fishing operation may take about 30-60 minutes. The *sigbi* fishers spend a total of 4-6 hours in a fishing day depending on the tidal cycle.

# SEINE

Local Name: *Hila-hila, Panabyosan*

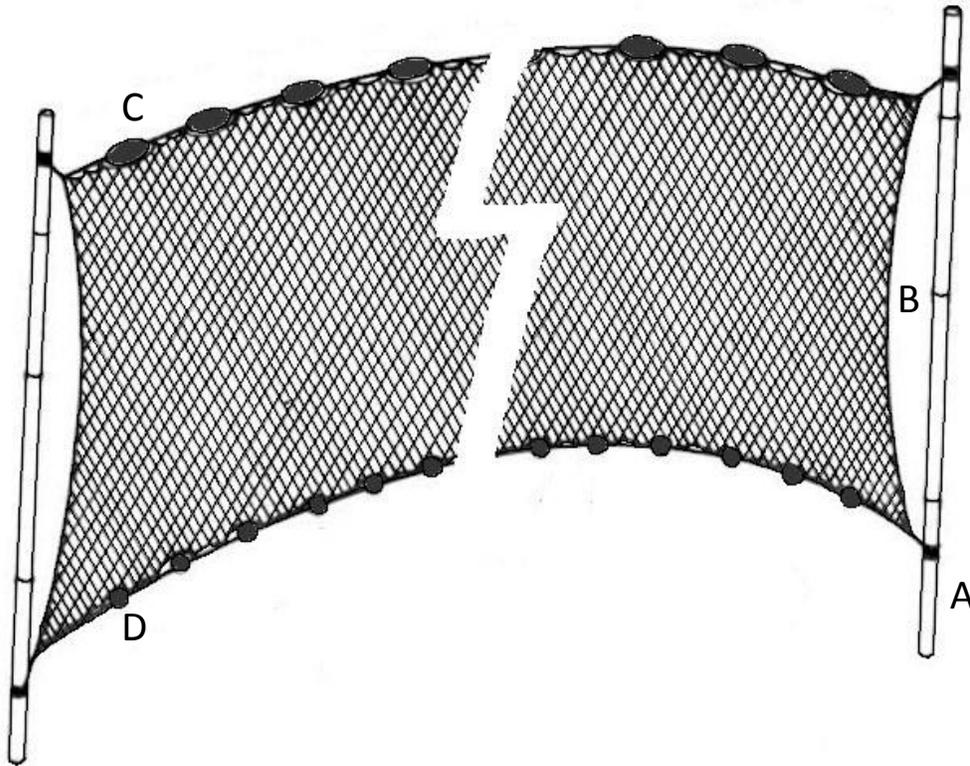


## At a Glance

1. A *hila-hila* or a *panabyosan* is a fishing gear that captures fish by seining the water column.
2. The gear is made of a long netting panel. Both ends of the net are attached to a bamboo pole.
3. Two persons are required in this fishing method. Each person holds the bamboo at both ends of the net.
4. The gear is used in shallow waters, often not more than chest-deep.
5. Target species of a *hila-hila* are mullets, slipmouth, mojarras and other fish that are present in the sandy and shallow estuarine waters.
6. A *panabyosan* often targets *tabios* or goby larvae, hence the name of the fishing gear.

## GEAR DESCRIPTION

### Parts of a *Hila-hila*, *Panabyosan*

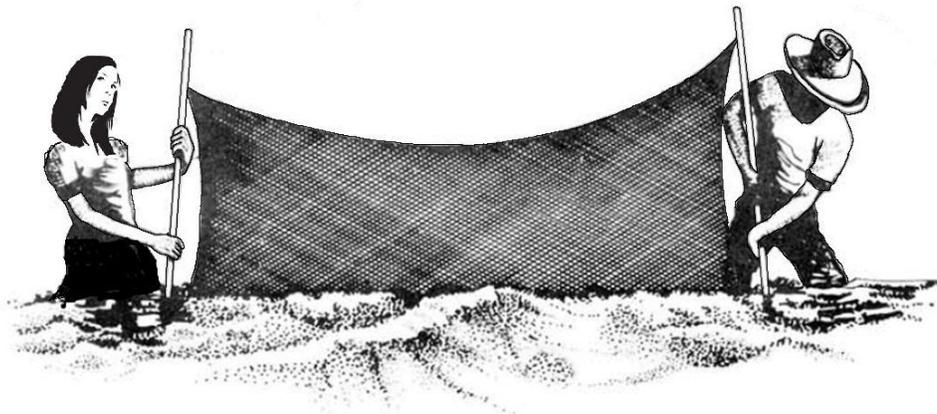


A - Bamboo pole

B - Netting

C - Headrope with floats for *hila-hila* (without floats for *panabyosan*)

D - Footrope with sinkers for *hila-hila* (without sinkers for *panabyosan*)



## GEAR DESCRIPTION

### Parts of a *Hila-hila*, *Panabyosan*

#### Net Body (Netting)

<b>Function</b>	<b>Materials Used</b>
The net body captures species that have been enclosed by the netting wall.	Nylon (PA) (for <i>hila-hila</i> ) HDPE (for <i>panabyosan</i> ) Mesh opening: mostly No. 13 & 14

#### **Description**

The length of a *hila-hila* net is about 100-200 m. Net height is 100 meshes. A *panabyosan* netting is shorter at about 10-20 m.

#### Headrope

<b>Function</b>	<b>Materials Used</b>
The headrope helps ensure that the net maintains its appropriate shape. It also provides attachment for the floats.	Material: PE Diameter: 4.5 mm

#### **Description**

The headrope in a *hila-hila* is composed of two pieces twine. The first twine is where the netting is hung. The second twine is the floatline where floats are attached. Finally, both lines are joined together using PA twines.

#### Floats (for *Hila-hila* only)

<b>Function</b>	<b>Materials Used</b>
The floats ensure that the net opens vertically underwater.	Rubber

#### **Description**

Floats are tied to the floatline using PA. The interval between each float is about 20 cm.

## GEAR DESCRIPTION

### Parts of a *Hila-hila*

#### Footrope

<b>Function</b>	<b>Materials Used</b>
The footrope helps ensure correct net shape. It also provides attachment for the sinkers so that the net opens vertically underwater.	Material: PE Diameter: 4.5 mm

#### **Description**

The footrope in a *hila-hila* is composed of two pieces twine. The lower meshes of the net are attached to the first twine. The second twine is the sinkerline where sinkers are tied. Finally, both lines are joined together using PE or PA twines.

#### Sinkers (for *Hila-hila* only)

<b>Function</b>	<b>Materials Used</b>
The sinkers ensure that the net opens vertically underwater.	Lead

#### **Description**

Lead sinkers are tied to the sinkerline using PA. The interval between each sinker is about 20 cm.

#### Bamboo pole

<b>Function</b>	<b>Materials Used</b>
Provides support to keep net in proper shape. Also used in handling net during seining process.	Bamboo, 2 pcs Length: 1.5 - 2 m

#### **Description**

A bamboo pole is placed at each end of the net. This is attached to the headrope and footrope.

## FISH CATCH INFORMATION



The dominant catch of a *hila-hila* are mullets, slipmouths and mojarras. Other species caught are whittings, halfbeaks, blue swimming crabs and rabbitfishes.



The dominant catch of a *panabyosan* are fish larvae locally called *tabios* (see picture above). These are mostly goby larvae, although clupeid, engraulid and other fish larvae may also be caught.

Also caught are juvenile and sub-adult mullets, gobies, mojarras, cardinalfishes and ambassids.

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Ave. Cost per unit</b> 2,000 to 4,300 pesos</p>	<p><b>Number of fishers:</b> Usually 2 persons</p>
<p><b>Who constructs?</b> Fisher himself, may be assisted by family members</p>	<p><b>Who helps in the fishing operation:</b> Usually a relative, such as the wife, son</p>
<p><b>Ave. no. of days spent on construction</b> 3-4 days</p>	<p><b>Boat used:</b> Boat is often not used during operation. Boat is used to transfer fishing grounds.</p>
<p><b>Type of maintenance</b> Net repair</p>	<p><b>Time fisher sets net:</b> Early morning to late afternoon</p>
<p><b>Frequency of maintenance</b> 1-4 times a month</p>	<p><b>Time fisher retrieves net:</b> Each operation may last 10-20 min.</p>
<p><b>Who performs maintenance?</b> Fisher himself</p>	<p><b>Total time spent fishing:</b> 3-4 hours</p>

## DESCRIPTION OF FISHING OPERATION

### ***Panabyosan***

Fishing is performed by two persons. This fishing gear is often set in shallow areas including spaces within a mangrove area. Each person carries the bamboo pole attached to both ends of the net (see pictures next page).

With the net set in semi-circular pattern, the two fishers walk towards the shore area ensuring that the footrope is touching the substrate. After seining the water for about 3-5 min, the footrope is raised to trap fish. The fish caught is transferred to a container and fishing operation resumes again.

## DESCRIPTION OF FISHING OPERATION



A *panabyosan* fishing operation

## DESCRIPTION OF FISHING OPERATION

A *hila-hila* is operated in a shallow area. Fishing ground is usually sandy, as the gear is towed towards the shore.

A *hila-hila* is operated by two persons. One person stays on the shore holding one end of the net. The other person sets the net while walking. The net is set in a semi-circle pattern. The enclosed area by the net depends on the net length.



Once the entire length of net has been set, the second person takes hold of the second end of the net and moves to the shore. Both fishers will start pulling the net towards the shore. As the net is pulled, the enclosed area decreases and the two fishers move nearer each other. By the time the entire net has been pulled towards the shore, the two fishers have already reunited. The footrope is raised to capture the fish that has been enclosed. Fish caught are stored in a bucket or polystyrene container. The same fishing procedure is repeated, often in another area. After fishing, catch is brought home for sorting and selling.

# PUSH NET

Local Name: *Sagudsong, sagudsod*

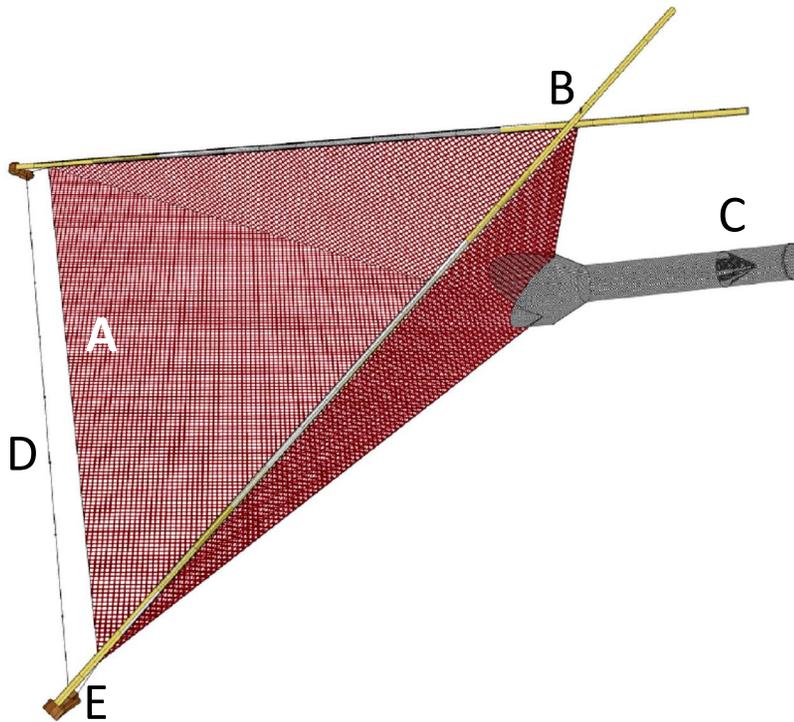


## At a glance

1. A *sagudsod* is a portable fishing gear that looks like a big scoop net with a fixed or collapsible frame made of bamboo.
2. The netting material used is fine-meshed primarily to capture shrimp. Other species caught are sergestid shrimp *Acetes*, crabs, gobies and other small fishes.
3. A *sagudsod* is operated by a single person.
4. Fishing operation can be operated either at low or high tide, early morning or dusk.
5. Fishing operation is performed by walking along the fishing ground. A boat is used to travel to or transfer fishing grounds.
6. A single unit costs about 600-1,000 pesos to construct. Usually the fisher himself makes his own gear.

## GEAR DESCRIPTION

### Parts of a *Sagudsong*



A - Net                      B - Bamboo Frame      C - Codend  
 D - Footrope              E - "Slippers"

<b>Netting</b>	
<p><b>Function</b></p> <p>The net is used to sieve the water column to capture fish.</p>	<p><b>Materials Used</b></p> <p>1. Netting                      Type: Pamo, Polarex, Kuralon, Nylon                      Mesh opening: No. 11 – 28,                      usually No. 22</p> <p>2. Twine (for tying): PE or PA</p>

**Description**

The netting is usually 3 m wide and 4 m long. This is tied to the bamboo poles using PA or PE twine.

## GEAR DESCRIPTION

### Parts of a *Sagudsong*

#### Frame

**Function**

The frame maintains the shape of the net. It is used by fisher for handling.

**Materials Used**

Bamboo, 2 pcs, 3<sup>rd</sup> class

**Description**

A pair of collapsible bamboo poles that are about 3 m long. The poles are arranged like a pair of scissors where the net body is attached.

#### Codend

**Function**

Part of the gear where captured fish is retained.

**Materials Used**

HDPE Raschel net, diamond mesh, knotless

**Description**

The codend is usually 3-4 m long. A PA or PE twine is used to tie the terminal end.

#### Footrope

**Function**

The footrope makes contact with the substrate as the gear is pushed forward, thus surprised shrimp and fish jump into the net.

**Materials Used**

Twine: PA or PE  
Lead sinkers, 6 cm interval

**Description**

Both ends of the footrope are attached to the lower end of the bamboo frame.

#### Slippers

**Function**

The “slippers” allow the gear to be easily pushed forward against the substrate.

**Material Used**

Metal screw, 1 pc  
Improvised wooden slippers, 2 pcs

**Description**

The wooden “slippers” ensure the smooth pushing movement of the push net against the substrate.

## FISH CATCH INFORMATION

Peak Season	Lean Season
<b>Months:</b> Sep to Dec; Mar to Jun	<b>Months:</b> Apr to Aug
<b>Ave. catch per day:</b> 2-7 kg	<b>Ave. catch per day:</b> 0.5-1 kg
<b>No. of fishing days:</b> 4- 30 days per month	<b>No. of fishing days:</b> 4- 28 days per month

### Dominant Species Caught



Penaeidae  
Shrimps  
Local name: *Batod*

### Example of Other Species Caught



Sergestidae  
Sergestid shrimps  
Local name: *Banlag*



Penaeidae  
Tiger prawn  
Local name: *Sugpo*



Portunidae  
Blue swimming crab  
Local name: *Kasag*

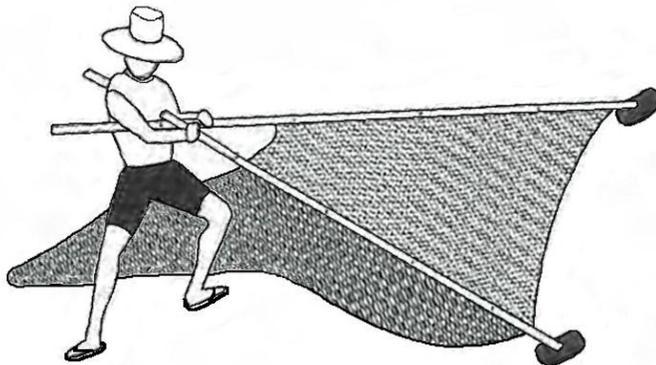


Gobiidae  
Gobies  
Local name: *Tanga, Bagtis, Piyagot*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

Gear Construction and Maintenance	Fishing Operation
<p><b>Average cost per unit</b> 600-1,000 pesos</p>	<p><b>Number of fishers:</b> Usually one person</p>
<p><b>Who constructs gear?</b> Fisher himself</p>	<p><b>Boat used</b> Usually non-motorized Some may use a bamboo raft A few others walk to fishing ground</p>
<p><b>Number of days spent on construction</b> 2-3 days</p>	<p><b>Time start fishing</b> During low tide Fishing continues as long as water level remains chest high</p>
<p><b>Estimated gear life span</b> ~3 years</p>	<p><b>Total time spent fishing:</b> ~ 2-5 hrs</p>
<p><b>Frequency and type of maintenance</b> Usually once a week Net mending and repair</p>	

### DESCRIPTION OF FISHING OPERATION



Fishing operation using a push net is performed early morning or late afternoon along shallow waters. Shrimp and fish are caught by the “pushing” action and the contact of the footrope along the substrate.

Fishing operation is usually performed by one person. Fishing lasts for about 2-5 hours. When fishing early morning or early evening, the fisher often uses an improvised headlight to provide illumination.

# ENCIRCLING NET WITH THE USE OF FISH SHELTER

Local Name: *Gango*



## At a Glance

1. *Gango* is a fishing method that utilizes a fish shelter, which functions as a fish aggregating device.
2. Target species are rabbitfish, scats, and other fish that aggregate in the shelter.
3. The shelter is constructed using materials such as tree branches, bamboo twigs and used tires.
4. About 2 weeks after the shelter has been constructed, the *gango* fisher encloses the shelter with a net.
5. Fishing operation generally requires one fisher.
6. A non motorized boat is used during the operation.

## GEAR DESCRIPTION

### Parts of a *Gango*



#### Shelter

***Function***

The shelter is a fish aggregating device.

***Materials Used***

Bamboo twigs, tree branches, used tires, wooden debris

***Description***

The shelter is set at the bottom. The area occupied by the shelter may range from 4-16 m<sup>2</sup>. The quantity of materials needed to erect a shelter depends on the shelter area.

#### Net body

***Function***

The net is used to enclose the shelter and trap fish that have aggregated.

***Materials Used***

HDPE Raschel net knotless

***Description***

The length of the net ranges from 40 to 60 m. Net height is about 2 m.

## GEAR DESCRIPTION

### Parts of a *Gango*

<b>Codend (Puyo)</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
Fish is captured at the codend of the net.	HDPE Raschel net knotless

***Description***

The codend is located at the central portion of the net body. The length of the codend is about 2 m. The terminal end of the codend is closed by tying a piece of twine.

<b>Headrope</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
Provides support to maintain proper shape of the net; for attachment of floats.	PE

***Description***

The headrope is composed of 2 pieces twine. The first twine is where the netting is hung. The second twine, which is the floatline, is where the floats are attached. Finally, both lines are joined together using PE or PA twines.

<b>Footrope</b>	
<b><i>Function</i></b>	<b><i>Materials Used</i></b>
Provides support to maintain shape of the net; for attachment of sinkers.	PE

***Description***

The footrope is comprised of 2 pieces twine. The first twine is where the lower meshes of the netting are passed through. The second twine, which is the sinkerline, is where the sinkers are attached. Finally, both lines are joined together using PE or PA twines.

## GEAR DESCRIPTION

### Parts of a *Gango*

#### Floats

<i><b>Function</b></i>	<i><b>Materials Used</b></i>
The floats ensure that the net opens vertically underwater.	Rubber

***Description***

The floats are tied to the floatline using PA. The interval between each rubber float is about 30 cm.

#### Sinkers

<i><b>Function</b></i>	<i><b>Materials Used</b></i>
The sinkers ensure that the net opens vertically underwater.	Lead

***Description***

The sinkers are attached to the sinkerline using PA. The interval between each sinker is about 15 cm.

#### Bamboo

<i><b>Function</b></i>	<i><b>Materials Used</b></i>
The bamboo posts serve as attachment; used to stake the net to the substrate.	Bamboo post, 3rd class, 2 pcs

***Description***

Both ends of the headrope and footrope are provided with bamboo poles. The bamboo poles are attached using PE twines.

## FISH CATCH INFORMATION

### Dominant Species Caught



Siganidae  
Rabbitfishes  
Local name: *Bueawis*



Siganidae  
Rabbitfishes  
Local name: *Danggit*



Scatophagidae  
Spotted scats  
Local name: *Kilo, Kikiro*

### Some Other Species Caught



Serranidae  
Groupers  
Local name: *Inid*



Gerreidae  
Mojarras  
Local name: *Batwanon*



Terapontidae  
Tigerperches  
Local name: *Bugaong*



Lutjanidae  
Snappers  
Local name: *Awuman*



Leiognathidae  
Slipmouths  
Local name: *Aputoe, sapsap*



Portunidae  
Swimming crabs  
Local names: *Kasag, Kaeantugas*

## GEAR CONSTRUCTION, MAINTENANCE AND FISHING OPERATION

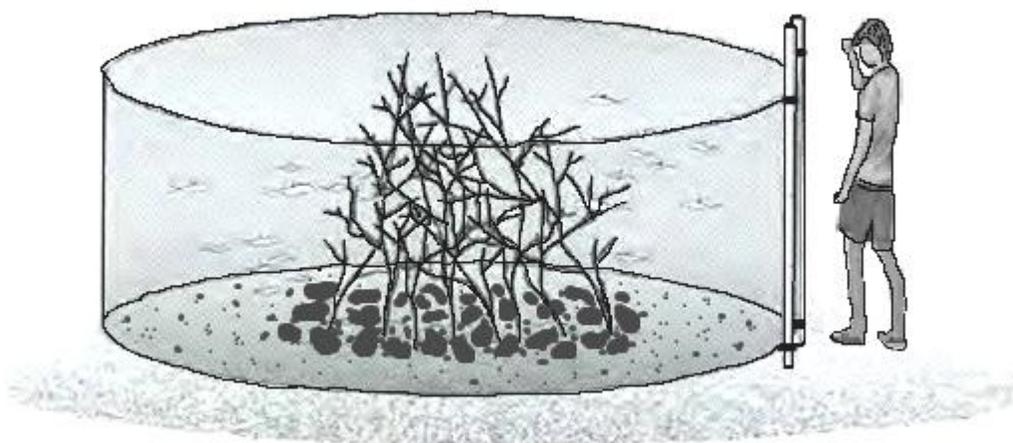
Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit</b> 1,000 pesos</p> <p><b>Who constructs?</b> Fisher himself</p> <p><b>Number of days spent on construction</b> 1-2 days</p> <p><b>Frequency of maintenance</b> Once a month</p> <p><b>Number of days spent on maintenance</b> 1 day</p> <p><b>Type of maintenance</b> Net repair</p> <p><b>Who performs maintenance?</b> Fisher himself</p>	<p><b>Number of fishers:</b> Usually 1 person</p> <p><b>Boat used:</b> Usually a non-motorized boat</p> <p><b>Time fisher conducts fishing operation:</b> At low tide, usually at daytime</p> <p><b>Time spent fishing:</b> Each operation may last about 30-60 min depending on area of shelter.</p> <p><b>Total time spent fishing:</b> 3-4 hours, depending on the number of shelters set</p>

The use of *gango* yields about 10 kg fish per operation. Number of fishing days is 6-8 per month because fishing operation is conducted only during low tide at daytime.

The fish shelter is constructed in shallow waters, thus it can pose as a navigation hazard.

## DESCRIPTION OF FISHING OPERATION

The *gango* is set in shallow waters, about 1.5 and 3 m at low tide and high tide, respectively. He allots 2 weeks for fish to aggregate in the shelter. During high tide, the fisher checks for presence of fish. The estuary is often turbid so he cannot see the presence of fish. However, they claim that they can hear the presence of fish.



During fishing, the fisher surrounds the fish shelter *gango* with net. He then dives into the surrounded area and removes the shelter materials. Finally, the enclosed area is reduced to capture fish.

Once fish presence is confirmed, he sets the net during low tide. The bamboo at one end of the net is staked into the substrate and net is set surrounding the shelter. Once encircled, both ends of the net meet. The bamboo at the other end of the net is also staked into the bottom. The shelter is now completely surrounded by the net. The fisher starts to dive into the enclosed area and removes the shelter materials. Once the enclosed area has been cleared, the fisher starts to reduce the enclosed area so that fish is driven towards the codend.

Captured fish is transferred to a container or a scoop net. He then moves to the next *gango* to conduct another fishing operation.

# LINE FISHING

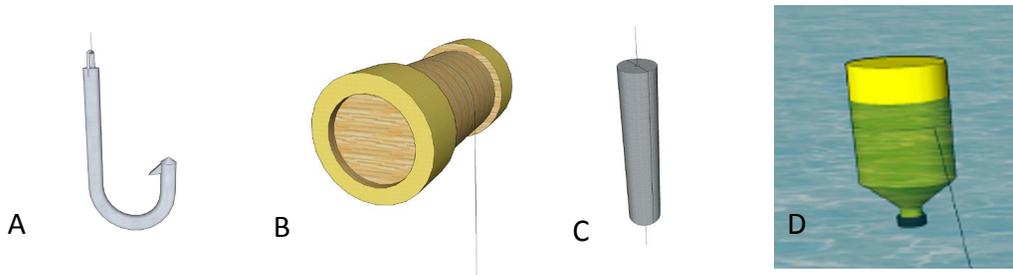


## At a glance

1. Line fishing employs hooks attached to PA monofilament that is weighted with lead or stone.
2. This fishing method includes the use of simple hook and line, multiple handline and bottom-set longline.
3. To lure fish, the hook is baited using food items such as small fish, shrimps, squid or shellfish. In one variant, the multiple handline, colored silk screen is used as luring material.
4. Fishing generally employs a single person aboard a non-motorized boat.
5. The hook and line fisher spends about 4-6 hours during each fishing trip.
6. Line fishing is a relatively cheap fishing gear. Simple forms cost less than a hundred pesos per unit. A longline has a higher construction cost because it is made of a longer line with more hooks.

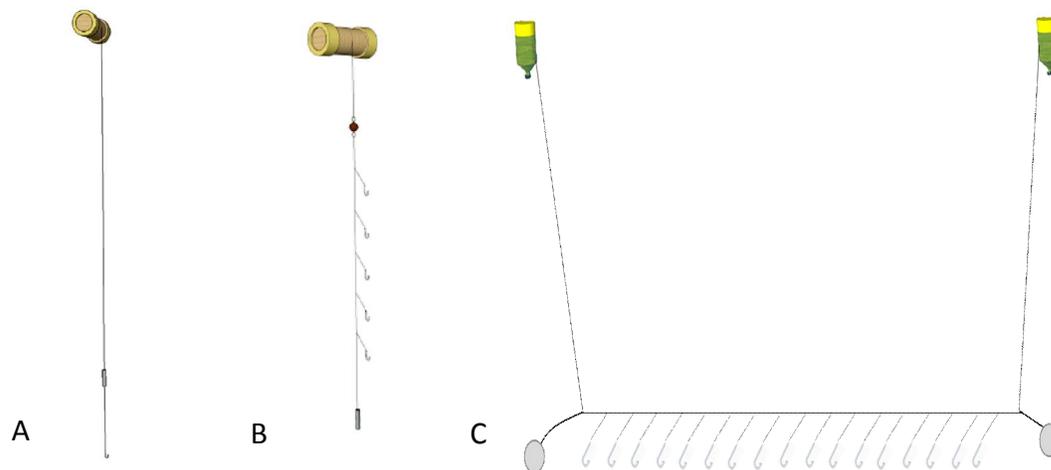
## GEAR DESCRIPTION

### Components of a Line Fishing Method



Line fishing requires simple materials. The basic components are the nylon monofilament, hook (A), a modified bamboo spool (B), sinker (C), and buoys for longlines (D).

### Line fishing in an estuary



- (A) Simple handline
- (B) Multiple handline
- (C) Bottom-set longline

Type	Local Name	Target Species
Simple handline	<i>Taplik, Pamunit</i>	Mojarras, breams, scats, trevallies, grunts, emperors, groupers
Multiple handline	<i>Tiwtiw, Into-into</i>	Groupers, emperors, breams, grunts, scats
Longline	<i>Kitang</i>	Breams, grunts, groupers, snappers, eel, jacks

# SIMPLE HANDLINE

**Local Name: *Taplik, Pamunit***

## Description

Handline fishing is the use of a single hook attached at the end of the weighted PA monofilament. The length of the mainline ranges from 9 to 15 m. The hooks used are J-shaped and mostly manufactured by Mustad. Hook size varies according to target species. Baits used vary according to fisher but the most common forms are shrimps, shellfish, fish and hermit crabs. Each fishing operation utilizes about 0.5 kg bait. Fishing accessories include the bamboo or wooden spool for coiling the line and a scoop net to temporarily store caught fish.

Handline fishing may be conducted all-year round as long as the weather permits. Peak months are February to April with catch that ranges from 2-5 kg per trip. Lean months are from May to August with 1-2 kg catch per trip. In the New Washington-Batan estuaries, line fishing is conducted near the mouth of the estuary because water in this area is less turbid.

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit:</b> 50 - 100 pesos</p> <p><b>Who constructs?</b> Fisher himself</p> <p><b>Number of days spent on construction</b></p> <p>Less than 1 day</p>	<p><b>Number of fishers:</b> 1</p> <p><b>Boat used:</b> Usually non motorized</p> <p><b>Time start fishing:</b> Around 5:00 AM</p> <p><b>Time end fishing:</b> Around 12:00 noon</p>

# MULTIPLE HANDLINE

**Local Name: *Tiw-tiw, Into-into***

A multiple handline has several hooks to increase the chance of catching fish. Because the estuary can be shallow, a multiple handline in the New Washington-Batan area usually has about 25-40 hooks. Each hook is attached to a branchline (PA No. 25 to 50) which in turn is attached to the mainline (PA No. 30 to 50) at an interval of about 0.5 - 1 m. The branchline is about 0.5 to 2 m in length. A sinker, usually lead, is used to reach the desired depth.

# MULTIPLE HANDLINE

Local Name: *Tiw-tiw, Into-into*

## Description

Fishing operation is performed by a single fisher aboard a non-motorized boat. Normally, the fisher jerks the line during fishing so that the bait could attract more attention from passing fish.

This gear can be used all year round as long as the weather allows fishing operation. Depending on the season and the target species, the type of bait used varies. During the months January to May, some *tiw-tiw* fishers use artificial lures to catch mackerel and sardines. Other bait materials used are small shrimps, hermit crab and sliced fish to lure groupers, emperors, breams, slipmouths, mojarras, scats, grunts and other species.

Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit:</b> 200-300 pesos</p> <p><b>Who constructs?</b> Fisher himself</p> <p><b>Number of days spent on construction</b></p> <p>Less than 1 day</p>	<p><b>Number of fishers:</b> 1</p> <p><b>Boat used:</b> Usually non motorized</p> <p><b>Time start fishing:</b> Around 5:00 AM</p> <p><b>Time end fishing:</b> Around 12:00 noon</p>



A multiple handline has about 20-30 hooks attached to the mainline. Fish is lured using baits. In this example, colored synthetic polymer is used as artificial lure.

# BOTTOM-SET LONGLINE

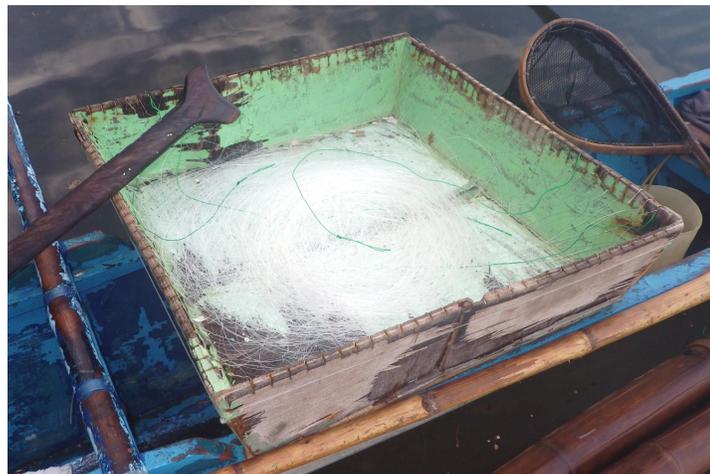
Local Name: *Kitang*

## Description

A *kitang* consists of a PA monofilament mainline with about 200-400 PA monofilament branchlines. Each branchline has a single hook. Distance between branchlines is about 1 m. Both ends of the mainline are provided with stone or lead sinkers to keep the fishing gear submerged. A buoy, either bamboo, polystyrene, empty plastic bottle or PE, is also attached at each end of the mainline to mark the gear's position.

Fishing operation is performed by a single fisher aboard a non-motorized boat. In the estuary, a longline is often set during high tide period. It is soaked for about 4-6 hours after which, the fisher retrieves the gear. This gear can be used all year round as long as the weather allows fishing operation. Bait used are shrimps, squid or sliced fish. Catch includes breams, grunts, emperors, groupers, jacks and trevallies, snappers, and eels.

A *kitang* is stored in a bamboo box to prevent entanglement. The top of the box is lined with rubber where hooks can be safely attached. It also allows fisher to easily place bait at the hooks.



Gear Construction and Maintenance	Fishing Operation
<p><b>Cost per unit:</b> 600-1,000 pesos</p> <p><b>Who constructs?</b> Fisher himself</p> <p><b>Number of days spent on construction</b></p> <p>About 1 day</p>	<p><b>Number of fishers:</b> 1</p> <p><b>Boat used:</b> Usually non motorized</p> <p><b>Time gear is set:</b> At high tide</p> <p><b>Time gear is retrieved:</b> After 4-6 hours soaking</p>

# SCOOP NET

Local Name: *Sibot, Panadyap Hipon*



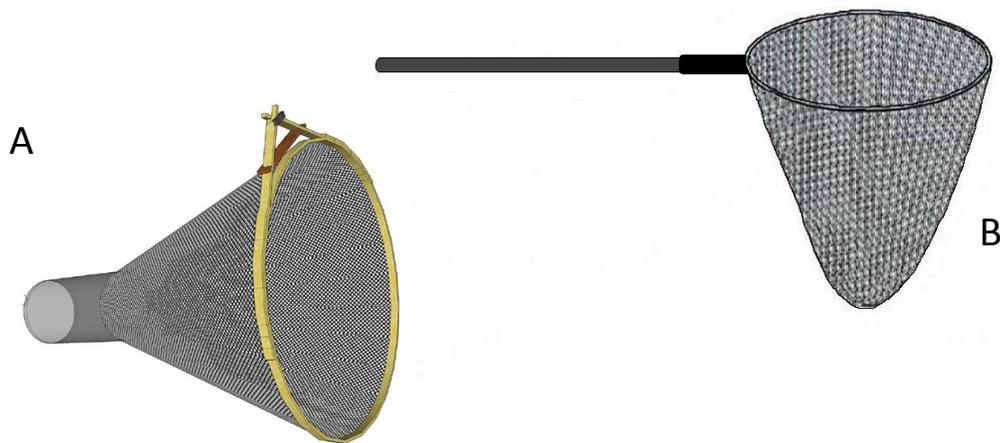
## At a glance

1. A scoop net is a small fishing gear made primarily of conical-shaped netting with a bamboo frame and handle.
2. It is locally called *panadyap hipon* because the primary target species are sergestid shrimps (*hipon*).
3. Fishing operation requires diving underwater. *Panadyap hipon* operators are skilled skin divers who can stay underwater for a long period.
4. Fishing operation is conducted daytime and may last for 4-6 hours per day.
5. Fishers use small non-motorized boats to conduct fishing operations.
6. Construction cost is about 300 pesos per unit.

## DESCRIPTION OF FISHING OPERATION

Fishing operation begins with the fisher searching for sergestid shrimp schools through diving. He uses minimal equipment during diving—a pair of improvised fins and underwater mask. There is no gas supply so fisher has to resurface after several seconds.

To collect sergestid shrimps, he uses the scoop net. These small shrimps are usually found at the substrate during daytime. Fishing operation may last from 4 to 6 hours in a fishing day.



- A) Scoop net as a main implement to capture sergestid shrimps
- B) Scoop net as an accessory in the operation of other fishing gears.

A scoop net (*sibot*) is often used as a fishing accessory. This tool has a longer handle usually made of bamboo. The long handle allows fisher to scoop fish from the fishing gear aboard a boat or atop a platform. This is often used in the operation of gears such as fish corral, shrimp traps, lift nets and filter nets.

A scoop net may also function as a temporary storage area for fish while fishing operation is ongoing. This is often a practice in line and gillnet fishing.

# DREDGE

Local Name: *Sudsud*



## At a glance

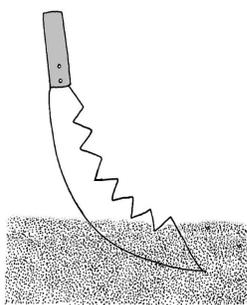
1. A manual dredge resembles a scoop net. It is an apparatus for dragging the seabed to collect benthic organisms.
2. It is made primarily of conical-shaped PE netting with a wooden frame and bamboo handle. The net opening is provided with rubber to facilitate dragging.
3. Target species are primarily bivalves and gastropods.
4. Fishing is performed at knee- to waist-high waters.
5. Fishing operation is conducted daytime and may last for 4-6 hours per day.
6. Construction cost is about 300 pesos per unit.

# MODIFIED SCYTHE

Local Name: *Karet*



## At a glance



Target species are freshwater eels *Anguilla* locally called *pueoy*.

1. A *karet* is used to locate and unearth eel that has buried itself in the substrate.
2. Eels are lured to the surface by sprinkling the substrate with water soaked in bait.
3. The fisher randomly scrapes the substrate with the blade. Once the blade encounters an eel, the serrated metal pulls the eel towards the surface (left, top).
4. The unearthed eel is then picked up by hand.
5. Fishing operation is conducted during low tide.
6. Fishing operation may be performed by both genders.

# SPEAR

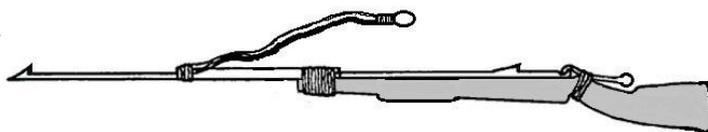
Local Name: *Pana*



## At a glance

1. A *pana* is used to catch fish while diving underwater.
2. Spear fishing is performed in areas with relatively clear waters.
3. Target catch are large fishes that aggregate near stationary fishing gears.
4. Fishing operation is conducted at daytime.
5. Time spent fishing is about 4-6 hours

A



B



Implements used by spear fishers are A) Spear gun, B) wooden-framed diving glasses, and C) improvised fins made of plastic, wood and rubber.

C



# **Chapter 4**

# **Guide to Conducting Fieldwork**

*Liberty Espectato and Ruby Napata*

## Methods in Conducting Field Work

# FGD

## Focus Group Discussions

### Purpose

This method can be used to collect general information, validate data, or gather opinions about an issue or topic from a small group of selected people representing different sectors or viewpoints. If facilitated well, it can also be used to build consensus.

### Application in Fisheries Research

The preferred composition of FGD participants depends on the purpose of the activity and the topic or issue for discussion. FGDs that are fisheries-related may involve representation of various stakeholders such as the fisherfolk (both municipal and commercial), fisherfolk leaders, fish traders, Barangay Council members, etc.

This activity can help the researchers validate the information gathered from other methodologies such as surveys and interviews. The preliminary data can be presented and the participants can affirm if such information or trend are true. Through discussions during the FGD, a researcher will be able to gather more information that may have been missed out during the survey or interview.

# Methods in Conducting Field Work

## 1. Focus Group Discussions

### Steps

1. Determine the target participants depending on your purpose. The number of participants should be manageable. Some literature say that a group of four to ten is the ideal number. The group needs to be large and varied enough to generate rich discussion. But, it should be not so large that some participants may be left out during the discussion.
2. At the start of the activity, present yourself, the purpose of the activity, and the reason why the participants are invited. Let the participants introduce themselves so that they will feel comfortable with each other.
3. This activity is usually performed by a pair of researchers. One of the researchers act as facilitator/moderator and the other keeps detailed notes of the discussion.
4. FGDs are structured around a set of carefully predetermined questions. Prepare general guide questions and let the group discuss freely. There should be minimal intervention by the facilitator. Encourage everyone to participate in the discussion to be able to gather their opinion.
5. At the end of the activity, do a synthesis of what has been discussed or agreed and thank the participants.

### SOME USEFUL TIPS

- A homogenous group composition is easier to facilitate. It also lessen inhibitions on the part of participants in expressing their viewpoints. However, for comparison purposes, you can first do the activity with a small homogenous group and repeat the activity with another homogenous group from another sector with a different viewpoint. If you have to do it in a heterogeneous group, make sure that you moderate or facilitate it well to avoid contradicting viewpoints resulting to heated arguments.
- If at some point, discussion is veering away from the topic or somebody is dominating the discussion, the facilitator should intervene and guide them back to the issue at hand.
- Choose a moderator or facilitator that has knowledge and skills in leading FGDs and interacting with a different group of people. He/she should also be familiar with the topic for discussion so that he/she could ask open questions and probe with relevant additional questions to stimulate conversation and reflection.
- Coordinating with local organization or agency is a must before the conduct of the FGD. These organizations or agencies are more familiar with the local context and they can suggest appropriate participants that can be invited.
- It is advisable to use local dialect during the discussion.

# KII

## Key Informant Interview

### Purpose

Key informant interview (KII) is a qualitative in-depth interview of somebody in a position (e.g., agency head), an expert in the field, or someone who has a first-hand information on the subject area. It aims to collect information in studies where a descriptive method is used or to supplement and verify information gathered from other research methods. Usually, a face-to-face interview is done and in some cases telephone interviews are employed.

### Application in Fisheries Research

In a fisheries research, a KII can be used to supplement information gathered from a survey. It can capture deeper insights not included in the survey form. It can also be used to gather information on sensitive topics (e.g., information about illegal fishers) which are not usually discussed in public. In fisheries policy studies, interviewing somebody in authority can help you arrive at appropriate policy recommendations.

KII is the least expensive social science research method and can be done in a short period of time. Thus, it can be employed in descriptive research, rapid assessments or scoping exercises that have minimal funding.

## Methods in Conducting Field Work

### 2. Key Informant Interview

#### Steps

1. Identify your target respondent depending on your research topic or on the information that you want to gather.
2. Set an appointment for the interview.
3. On the start of the interview, identify yourself and the purpose of your interview.
4. Prepare your interview tool or your guide questions beforehand. During the interview, probe when you need to clarify something about his/her answer.
5. Be sure to take down notes. If you need to audio record your conversations, ask the respondent first if he/she is amenable with it.
6. For sensitive topics, assure the respondent that the information will not be disclosed and will be kept confidential.
7. At the end of the interview, summarize the major comments you heard throughout the interview and ask the respondent if you have covered all the major points he/she raised. Ask the respondent if there is anything else that he/she would like add. End the interview by thanking the respondent for his/her time.

#### SOME USEFUL TIPS

- Establish rapport with your respondent to be able to solicit more candid answers.
- Be sure to do a little research first about your respondent, the mandate of his office related to your topic, or his personal view on the subject matter.
- Never argue with the answers of the respondent even if it contradicts with your personal opinion.
- Be punctual, persons in authority like politicians and agency heads are busy people. If you missed your appointment with them, it may be difficult to schedule another appointment.

# HS

## Household Survey

### Purpose

A household survey is usually done to do a census of the population in a certain area (e.g., fisher's population). Every household in the entire area serves as target respondent. This survey is conducted through face to face interview and usually gathers a wide range of data (e.g., household profile, fishing gears, fishing boats, etc) depending on the research objectives. A survey is a good way to gather quantitative information and sometimes people's perceptions and concerns.

### Application in Fisheries Research

In fisheries research, a household survey captures a wide range of primary data. This is one of the most expensive social science research methods because it involves a huge number of respondents and requires trained enumerators to conduct the survey.

## Methods in Conducting Field Work

### 3. Household Survey

Steps	SOME USEFUL TIPS
<ol style="list-style-type: none"><li>1. Prepare a comprehensive household survey questionnaire.</li><li>2. Translate the questionnaire into local dialect.</li><li>3. Pre-test the questionnaire and revise if needed. Train enumerators and conduct a mock interview to orient them in doing the actual survey.</li><li>4. Set an appointment with local officials to introduce the research and the research team. Ask permission to conduct the survey. Always coordinate with the local officials every time you are in the area.</li><li>5. Conduct the household survey in pairs (buddy system). One will do the interview and the other one will write the answers in the survey questionnaire. If possible, request for a local guide from the barangay or municipality who is familiar with the community.</li></ol>	<ul style="list-style-type: none"><li>• Wear proper attire in conducting household surveys (e.g., no sleeveless, no plunging necklines, no short shorts).</li><li>• Enumerators should make sure that they are familiar with the questionnaire.</li><li>• Schedule your fieldwork well. Familiarize with the fishers' fishing schedule and never do the interview during lunch time, when they are drinking alcoholic drinks, when they are playing cards, or when they are taking a nap.</li><li>• Never argue with your respondent. Listen and take notes including their problems.</li><li>• Maintain eye contact with your respondent. Be polite and serious.</li><li>• Do not commit anything (e.g., financial help) with your respondents that you cannot deliver.</li><li>• Don't be rude with your respondents. Establish nice rapport with them.</li></ul>

## Methods in Conducting Field Work

### 3. Household Survey

#### Steps

6. Introduce yourself and politely ask for his/her permission or willingness to be one of your respondents. If the person declines to be interviewed, respect his decision. You may tell the respondent that his/her answers will be used for research purposes only and shall be treated with confidentiality.
7. State your purpose clearly and ask the questions politely.
8. You may probe your respondents' answers and ask follow up questions but never argue with them.
9. Thank your respondents before leaving.

#### SOME USEFUL TIPS

- Bring some candies and biscuits for children. There are lots of them in fishing communities.

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