MODIFIED FISH CORRAL (PUNOT)

By

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INTRODUCTION

Under the Expanded Program of Technical Assistance, BFAR through Biyayang Dagat Program implements several projects aimed at encouraging and assisting fishermen to increase their catch through improved technology. One of these projects is the introduction of the modified fish corral.

Fish corral is a guiding barrier usually set at tidal flats close to the shore at different depths in sheltered waters to intercept fishes. It consists of three gates, two wings, a leader and three heart-shaped enclosures constructed in such a way that provide easy entrance but difficult exit for the intercepted fish. It is made of well-seasoned bamboo splits woven into finer screens and laid around the bamboo posts (Figures 1 and 3).

Recently, this fish corral was modified in order to make it more resistant to the action of waves and strong current. The bamboo mattings/screens were replaced by the machine made netting materials and the design was changed. The new fish corral has two enclosures, a terminal type of collecting crib and a leader but no wings (Figure 2).

Upon request of a Congressman from Region 6, a survey of Pilar Bay was conducted to assess the suitability of the fishing ground for the installation of a modified fish corral.

The criteria for the selection of a good fishing ground for fish corral operation are as follows:

1. The fishing ground is well-sheltered throughout the season;
2. It is frequented by schools of fish and within their migration route;
3. The sea bottom is sandy, muddy or a combination of both;
4. The water current is not more than three (3) knots;
5. The fish corral can be set perpendicular to the shoreline; and
6. The fishing ground is not subjected to fishing with the use of explosives.

Based on the above criteria, Pilar Bay was found to be suitable for the installation of a modified fish corral.

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The average water depth of Pilar Bay is about 7.5 fathoms. The bottom is sandy, muddy and rocky (P.C.G.S. 4413). The general water current is influenced mostly by the onset of flood tide and the receding ebb tide. The flow of tidal current is from the northeast to southwest direction. The coastal area is exposed during the northeast monsoon which makes fishing somewhat difficult. Fishing is favorable during the southwest monsoon (Figure 12).

CONSTRUCTION OF THE FISH CORRAL

A. Construction of the Net

The typical modified fish corral, locally known as "punot" is shaped like a curtain which is mounted slack to a side rope at each vertical end, and a headline and a footrope at each horizontal end. It is constructed by section parts, viz:

1. *Collecting Crib (Ligaw)*

It is a rectangular netting material of almost uniform mesh size hanging between the headline or headrope and the footrope or lead or sinker line. This portion of the corral where the fish are finally trapped is situated in the deeper waters. The net for the collecting crib is constructed wholly of nine (9) strips polyethylene of 400/15 x 16 K x 100 meshes down x 80 meters long (Fig. 4, Aa to Ai) with a uniform mesh size of 20.32 mm. stretched joined horizontally by means of lacing method. Lacing is a method of joining two (2) pieces of ready-made netting by winding and fastening a twine at intervals with a jam or stop hitch.

After lacing, two side ropes each measuring 16 meters long are singly rove to each end of the net; likewise, a headline and footrope each measuring 54 meters long, through the top and bottom of the net, respectively. Before hanging the net, 324 lead weights each weighing 143 grams are strung to the footrope or leadline at intervals of 16.5 centimeters.

In hanging, the secondary ropes which are rove through the netting are hung to their corresponding counterparts, viz, secondary headline to the primary headline, etc. at a hanging rate of 71.42% which means that every 1.4 meters of stretched netting is hung to 1 meter length of the primary lines or ropes. Riblines of 18.5 meters long polythylene rope, 1-1/8" in circumference or 3/8" diameter are passed through the meshes vertically at 4.5 meters intervals (Figure 4).

2. *First Enclosure (Tambahan)*

It is made up of two parts of equal size netting but different mesh size hanging between the headline and the leadline or footrope. The body of the first part is made of five (5) strips (Fig. 5, Aa to Ae). The uppermost strip consists of monofilament netting 0.55 knotted white, 50 meshes down x 239 meters long x 7K (50.8mm). The next two strips down are polyethylene nettings 400/18 x 5K x 100 meshes down x 239 meters long (76.2mm); next strip down is another polyethylene netting 400/15 x 50 meshes down x 239 meters long x 7K (50.8mm); and one bottom strip polyethylene netting 400/15 x 50 meshes down x 239 meters long x 9K (38.1mm) joined together by the lacing method. The second part of the net is made of 5 strips (Fig. 5, Aa to Ae) of the same netting materials, dimensions and specifications as that of the first part. Like in the construction of the net for the collecting crib, secondary ropes of equal lengths to the primary are rove through the four sides of net correspondingly. Each part has a hung depth of 15 meters and a hung length of 167.2 meters. The hanging proportion is 1.4 meters stretched netting to a meter length of both headrope and footrope. Riblines are also rove through the meshes vertically at 10.45 meters intervals. Lead sinkers (4.5 cm. long by 2.5 cm. weighing 143 grams each) are equally distributed at 16.7 cm. apart along the primary leadline at six (6) pieces for every one meter (Fig. 5).

3. *Second Enclosure (Palibod)*

It consists of two (2) rectangular nets of coarser parts. The first part, the longer one of the two, consists of 5 strips: the uppermost section of the body is a monofilament netting, 0.55 knotted white x 100 meshes down x 141 meters long x 12K to which is attached 4 strips of polyethylene netting, 400/15 x 100 meshes down x 141 meters long x 9K (38.1mm), all throughout the body laced together (Fig. 6, Aa to Af). Secondary ropes of equal lengths as the primary are rove through the sides of the nets correspondingly. The whole netting including the secondary ropes is hung to the primary headrope and footrope of 99 meters in length. The hung depth is 15 meters. The hanging ratio is 1.4 meters of stretched netting to 1 meter length of the hanging line of both upper and lower portion of the net. The second part is made of the same netting materials, specifications and dimensions as of the first part but with a hung depth of 15 meters and a hung length of 40 meters. (Fig. 6, Aa to Af). Strung to the whole footrope at intervals of 16.5 centimeters are 738 lead sinkers. Riblines of 17.5 meters long are rove through the meshes vertically at 9 meter intervals.

4. *Leader (Taktakon)*

It is a long (four-sided) netting set perpendicuiarly to the opening or main entrance of the corral, which is used to intercept fishes during their migration route. The fishes will tend to look for a way out and are led into the first enclosure, etc. until they are impounded in the collecting crib. The net is made of 4 strips of coarser polyethylene (Fig. 7, Aa to ab): 2 strips of 400/18 x 100 meshes down x 280 meters long x 3K (152.4mm) and 2 strips of polyethylene 100/18 x 100 meshes down x 280 meters long x 5K (76.2mm) laced together. The hanging rate is 1.4 meters stretched netting to one meter length of hanging line of both headrope and footrope. Lead weights with the same dimension as those in the first enclosure are distributed along the primary leadline (footrope) at six pieces for every one meter or 16.7 cm. apart (Fig. 7), and riblines too are rove vertically 14 meters apart.

INSTALLATIONS AT SEA

A. Installation of Posts

The masterfisherman carefully lays the outline of the fish corral on the proposed site by using imaginary lines and temporary stakes to indicate the parts and positions. He starts with the collecting crib in deeper waters, followed by the second and first enclosures and the leader towards the shallow water. The leader is extended in a straight line towards the shore and at right angle to the supposed direction taken by the fish as they drift with current.

Ten to fifteen men are needed to stake the bamboo posts following the outline set by the masterfisherman. Guide posts are planted first next to the end of the leader and corners of the different chambers. The planting of other posts follows by setting them at one-half to one meter apart for the enclosures and at one to two meters for the leader. Care is taken to make them properly aligned and perpendicular to the sea bottom. The posts are connected together and braced with one or four lines of bamboos about one meter apart horizontally with the lowest just about a

meter above the surface of the water. The braces serve as a catwalk of the fishermen while dragging the *sigin* from the first to the second compartment up to the collecting crib (Fig. 8-11)

B. Installation of the Net

The setting of the net usually begins with the collecting crib, followed by the succeeding enclosures and the leader. This order is followed because fishes often begin to enter into the enclosures as soon as they are set.

These are set inside the series nets of posts which compose the collecting crib. The upper ends of the riblines which are 1.5 meters long are tied to the lowest bamboo braces so that the net hangs by one meter from the water surface. To submerge the nets, stone weights weighing about 10 to 12 kilos each are tied to the bottom end of the riblines. Because of the weights the stones sink into the mud close to the bamboo stakes including the leadline and a portion of the bottom of the net. This seals the bottom of the corral and prevents possible escape of the fishes within the enclosures. The sidelines are tied to the end posts of each enclosure.

The procedure is repeated until all the nets are set in the different parts of the fish corral.

HAULING/FISHING OPERATION

The compartments are dragged successively with the *sigin* starting from the first chamber down to the collecting crib. The *sigin* is first stretched across the main gate to prevent the escape of the impounded fishes within the first enclosure. It is dragged slowly towards the next chamber. During this operation care is taken that the bottom of the *sigin* is kept close to the ground and the ends, to the walls of the enclosures. The fish are driven into the next chamber, and the same procedure is repeated in each succeeding section until the fish are finally impounded in the collecting crib from which they are brailed out with a dip net and placed in boxes on the waiting banca. The fish catch are then marketed.

CATCH COMPOSITION

There is a significant difference between the deep-sea and the shallow-water fish corral as far as production is concerned.

The volume and composition of catch for 25 days obtained from a modified fish corral set in the deeper portion of Pilar Bay totalled 6,580 kg valued at ₱10,620.00 (Table 1).

The modified fish corral in the deeper portion of Pilar Bay yielded better

quality fish while that in the shallower portion were low quality fish and smaller in size (Table 2).

CONCLUSION AND RECOMMENDATION

1. The modified fish corral set in deeper water yielded better quality of fish than the one installed in a shallower one. The slipmouths predominated the catch of the modified fish corral in shallow water.

2. As observed, the use of netting materials proved better than the bamboo screens because nets are more resistant to decay and action of waves and strong current; and

3. The life span of the netting materials is longer than that of the bamboo mattings because the latter will only last for one season whereas the former will last for two to three seasons, as per observation.

ACKNOWLEDGEMENT

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Table 1 – Volume, composition and percentage of daily catch from a modified fish corral installed in the deeper portion of Pilar Bay.

Date (1981)	Volume kg	CATCH COMPOSITION				
		Sardines (Sardinella spp) %	Crevalle (Caranx) %	Slipmouth (Leiognathus spp) %	Others	Total
April						
20	1,040	10	60	15	15	100
21	160	30	40	–	30	100
22	140	40	20	10	30	100
23	60	10	40	20	30	100
24	220	60	30	–	10	100
25	100	10	40	30	20	100
26	100	30	30	20	20	100
27	120	40	20	–	40	100
28	no hauling	–	–	–	–	–
29	20	50	30	–	20	100
30	300	60	30	–	10	100
May						
01	no hauling	–	–	–	–	–
02	60	30	40	20	10	100
03	260	30	20	–	50	100
04	440	80	10	5	5	100
05	400	20	60	–	20	100
06	400	20	–	60	20	100
07	320	65	10	10	15	100
08	280	10	–	85	5	100
09	280	60	30	–	10	100
10	200	10	60	20	10	100
11	280	70	10	10	10	100
12	360	60	30	3	7	100
13	200	40	10	–	50	100
14	150	30	20	–	50	100
15	270	75	15	5	5	100
16	140	45	10	–	45	100
TOTAL 6,580 kg – Average catch 243 kg/day						

Includes: *Half Beak – Hemiramphus far.*
Tuna – Thunnidae
Striped Mackerel – Rastrelliger
Short bodied Mackerel – Rastrelliger brachysomus
Barracuda – Sphyraenidae
Squids – Loligo
Cavalla – Caranx

Table 2. Volume, composition and percentage of daily catch from a modified fish corral installed in the shallow portion of Pilar Bay.

Date 1981	Volume kg	SPECIES											
		Crevalle (Caranx)		Sardines (Sardinella spp.)		Mackerel (Rastrelliger Chrysozomus)		Cavalla (Caranx)		Slipmouth (Leiognathus spp.)		Thera-ponid (therapon)		Pomfret (Apolectus niger)		Catfish (Arius spp.)	
			%		%		%		%		%		%		%		%
May	680	2		5		3		2		60		5		2		20	
21	680	2		5		3		2		60		5		3		20	
22	200	5		5		3		2		70		3		2		10	
23	200	5		10		5		5		60		5		–		10	
24	240	3		30		5		2		50		5		–		5	
25	480	3		20		3		3		65		3		–		3	
26	520	15		20		5		5		50		3		–		2	
27	140	10		10		5		5		55		10		–		5	
28	320	10		25		5		5		50		3		–		2	
29	360	20		15		5		5		50		2		3		–	
30	400	30		10		3		2		50		3		2		–	
TOTAL 3,510 – Average catch 354 kg/day																	

Fig. 1. Old fish corral (*basang moderno*)

Fig. 2. Modified fish corral (Punot)

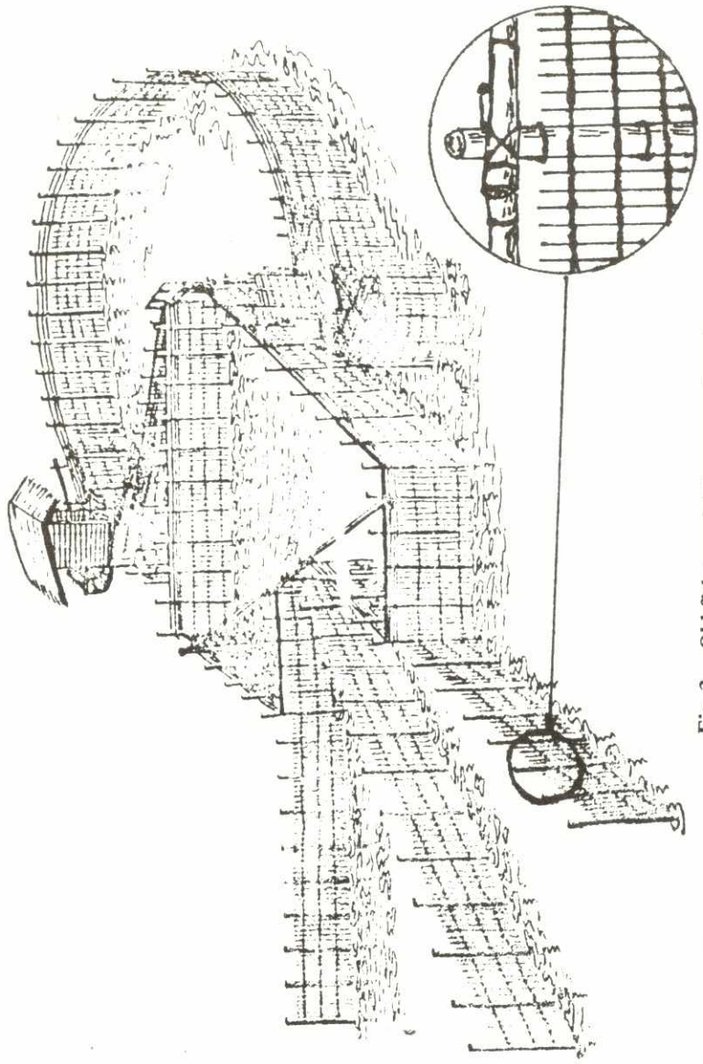
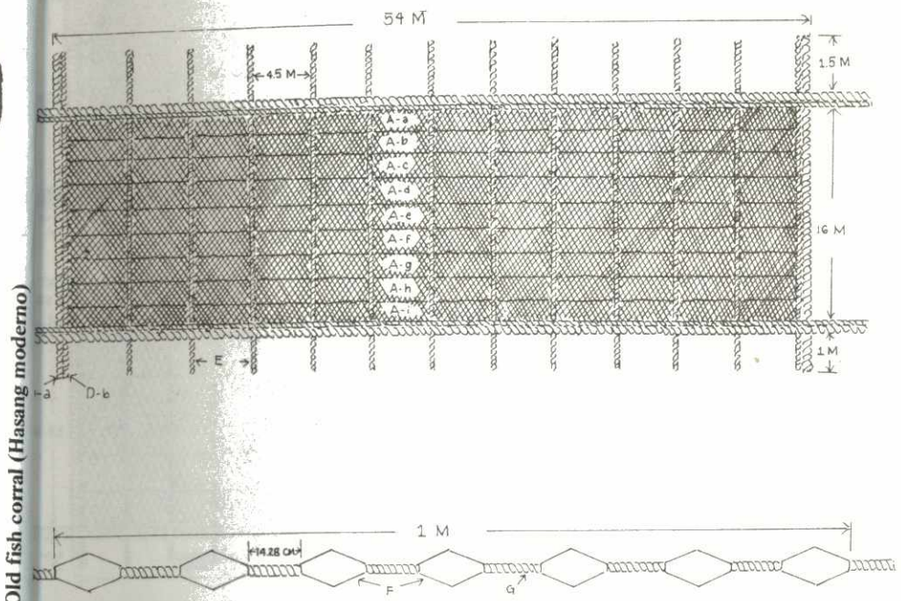


Fig. 3. Old fish corral (Hasang moderno)

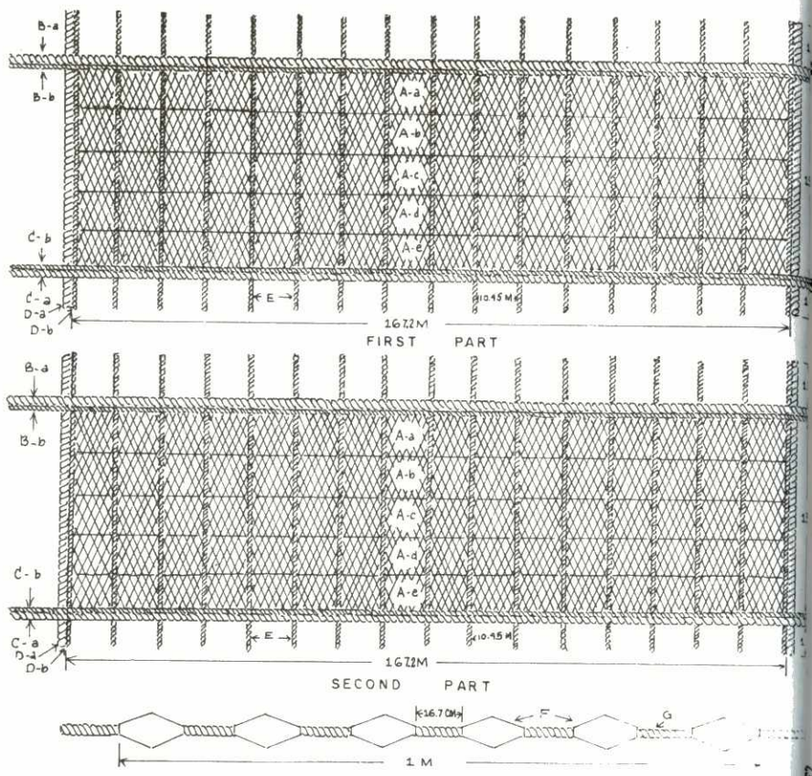


DISTRIBUTION OF SINKERS ALONG THE LEADLINE

LEGEND:

A-a to A-i	*POLYETHYLENE 400/15 100 Meshes down X 80 Meters long x 16K*
B-a	*POLYPROPHYLENE Primary Headrope No. 9*
B-b	*POLYPROPHYLENE Secondary Headrope No. 8*
C-a	*POLYPROPHYLENE Primary Leadline No. 8*
C-b	*POLYPROPHYLENE Secondary Leadline No. 8*
D-a	*POLYPROPHYLENE Primary Breastline No. 9*
E	*POLYPROPHYLENE Riblines No. 8 Rope I 1/8" Circumference X 3/8" Diameter*
F	*LEAD Sinker, 4.5 cm long x 2.5 cm at its greatest diameter x 143 grams*
G	*POLYPROPHYLENE Sinkers rope No. 8*

Fig.4. Collecting crib (Ligaw)

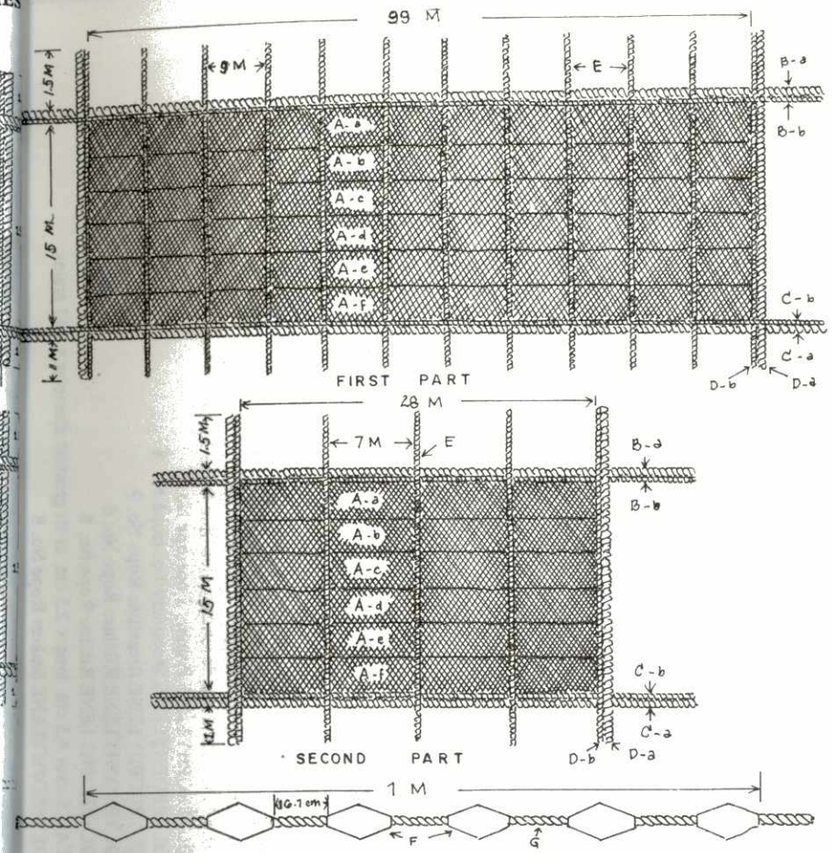


DISTRIBUTION OF SINKERS ALONG THE LEADLINE

LEGEND:

A-a	MONOFILAMENT 0.55 x 50 Meshes down x 239 Meters long x 7K
A-b to A-c	POLYETHYLENE 400/18 x 100 Meshes down x 239 Meters long x 5K
A-d	POLYETHYLENE 400/15 x 50 Meshes down x 239 Meters long x 7K
A-e	POLYETHYLENE 400/15 x 50 Meshes down x 239 Meters long x 9K
B-a	POLYPROPHYLENE Primary Headline, Rope No. 9
B-b	POLYPROPHYLENE Secondary Headline, Rope No. 8
C-a	POLYPROPHYLENE Primary Breastline, Rope No. 9
C-b	POLYPROPHYLENE Secondary Breastline, Rope No. 8
E	POLYPROPHYLENE Riblines, Rope No. 8
F	LEAD Sinkers, 4.5 cm long x 2.5 cm at its greatest diameter x 143 grams
G	POLYPROPHYLENE Sinker Rope No. 8

Fig. 5. First Enclosure (Tambahan)

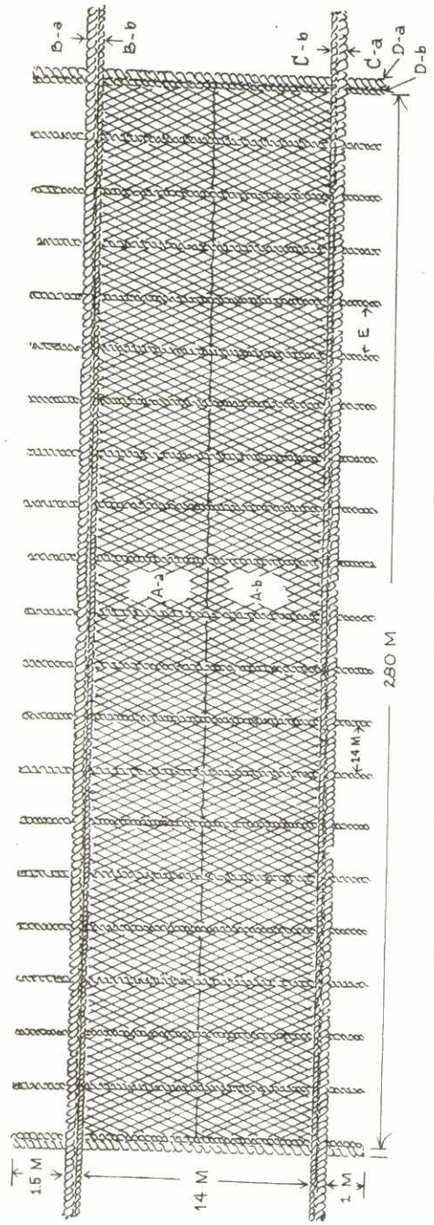


DISTRIBUTION OF SINKERS ALONG THE LEADLINE

LEGEND:

A-a	*MONOFILAMENT 0.55 x 100 Meshes down x 141 Meters long x 12K*
A-b to A-f	*POLYETHYLENE 400/15 x 100 Meshes down x 40 Meters long x 9K*
B-a	*POLYPROPHYLENE Primary Headrope No. 9*
B-b	*POLYPROPHYLENE Secondary Headrope No. 8*
C-a	*POLYPROPHYLENE Primary Leadrope No. 8*
C-b	*POLYPROPHYLENE Secondary Leadrope No. 8*
D-a	*POLYPROPHYLENE Primary Breastline No. 9*
D-b	*POLYPROPHYLENE Secondary Breastline No. 8*
E	*POLYPROPHYLENE Riblines 18.5 Meters long x 11/8" Circumference x 3/8" Dia.*
F	*LEAD Sinders 4.5 cm long x 2.5 cm at its greatest diameter x 143 grams.*
G	*Sinders Rope No. 8*

Fig. 6. Second Enclosure (Palibod)



DISTRIBUTION OF SINKERS ALONG THE LEADLINE

LEGEND:

Aa	POLYETHYLENE 400/18 x 100 Meshes down x 400 Meters long x 3K
A-b	POLYETHYLENE 400/18 x 100 Meshes down x 400 Meters long x 5K
B-a	POLYPROPHYLENE Primary Headline Rope No. 9
B-b	POLYPROPHYLENE Secondary Headline Rope No. 8
C-a	POLYPROPHYLENE Primary Footrope No. 8
C-b	POLYPROPHYLENE Secondary Footrope No. 8
D-a	POLYPROPHYLENE Breastline Rope No. 9
D-b	POLYPROPHYLENE Riblines Rope No. 8
E	POLYPROPHYLENE Ribline Rope No. 8
F	**LEAD Sinker 4.5 cm long x 2.5 cm at its greatest diameter x 143 grams**
G	

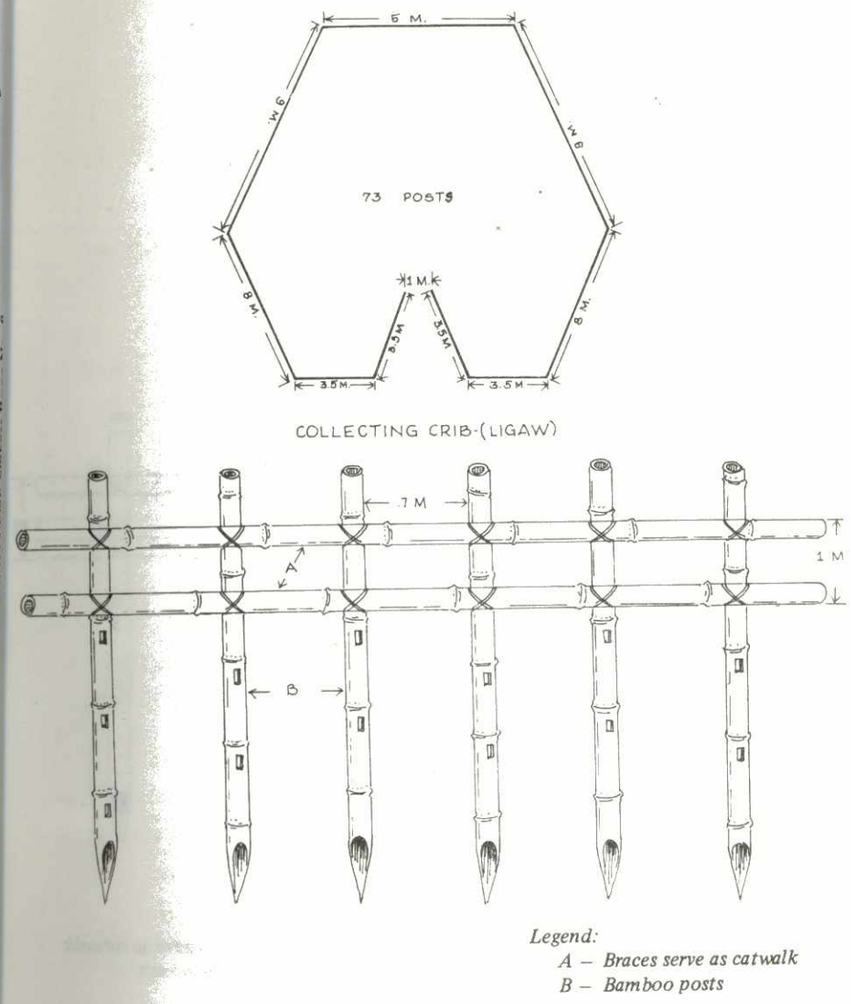
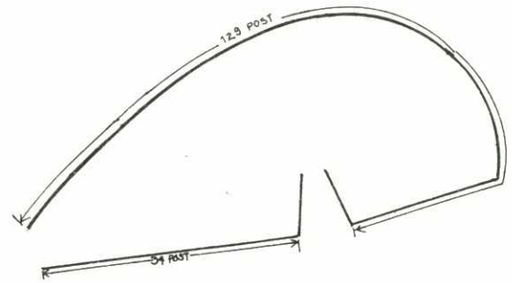
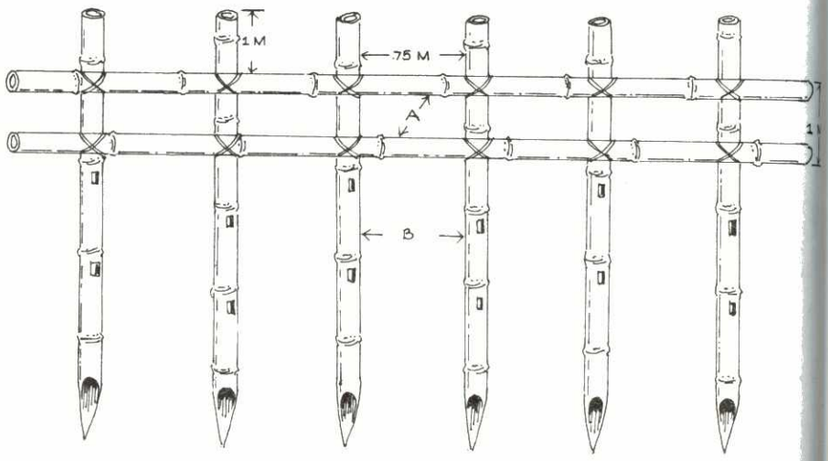


Fig. 8. The collecting crib, posts and braces

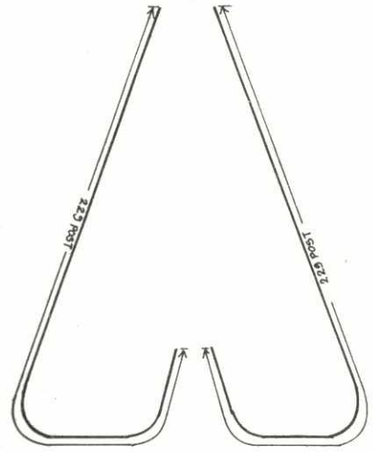


2ND ENCLOSURE - (PALIBOD)

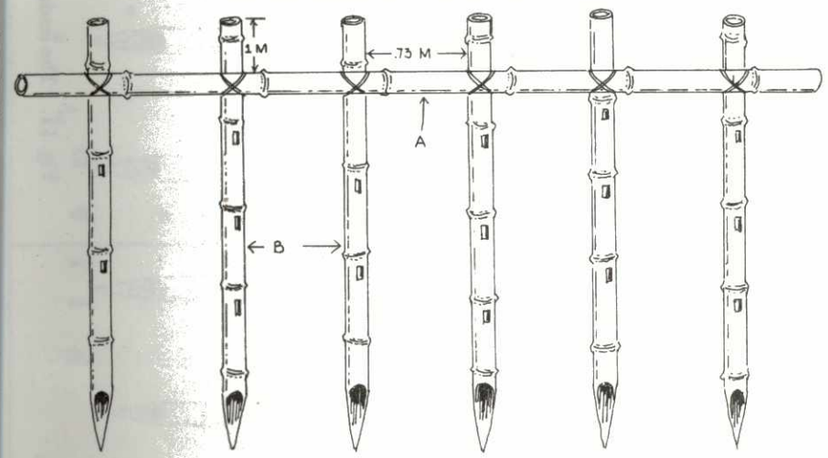


Legend:
A – Braces serve as catwalk
B – Bamboo posts

Fig. 9. The 2nd enclosure, posts and braces



1ST. ENCLOSURE - (TAMBAHAN)



Legend:
A – Braces
B – Bamboo posts

Fig. 10. The 1st enclosure, posts and braces

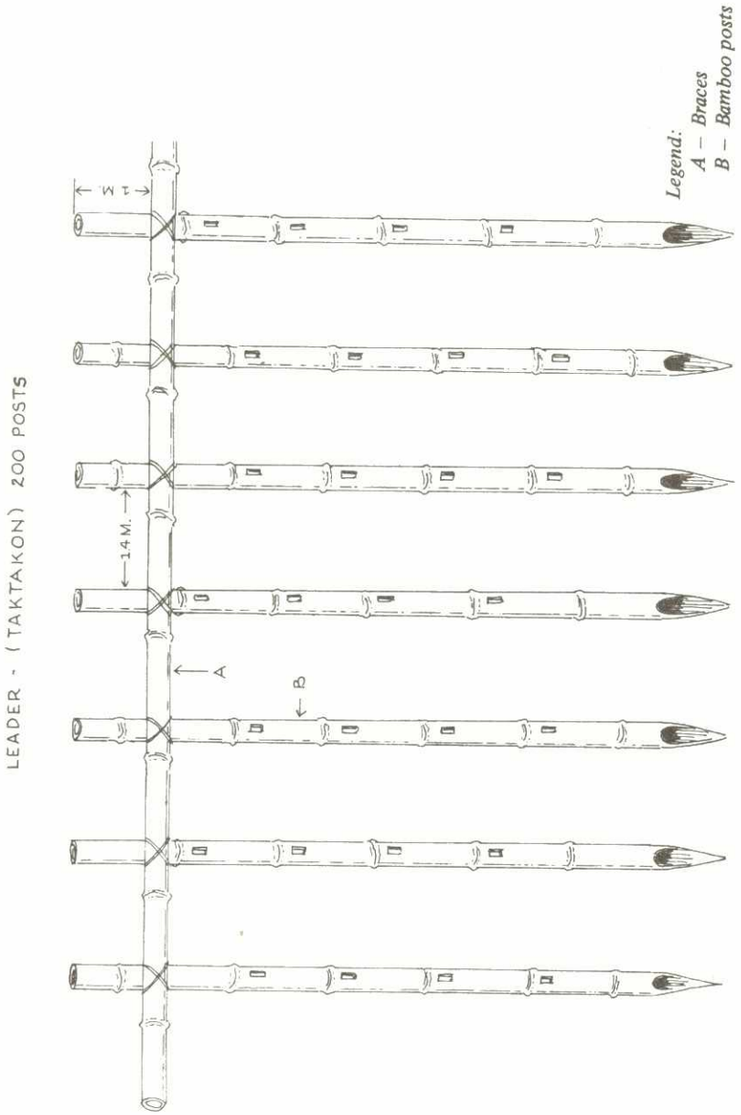


Fig. 11. The leader, posts and braces

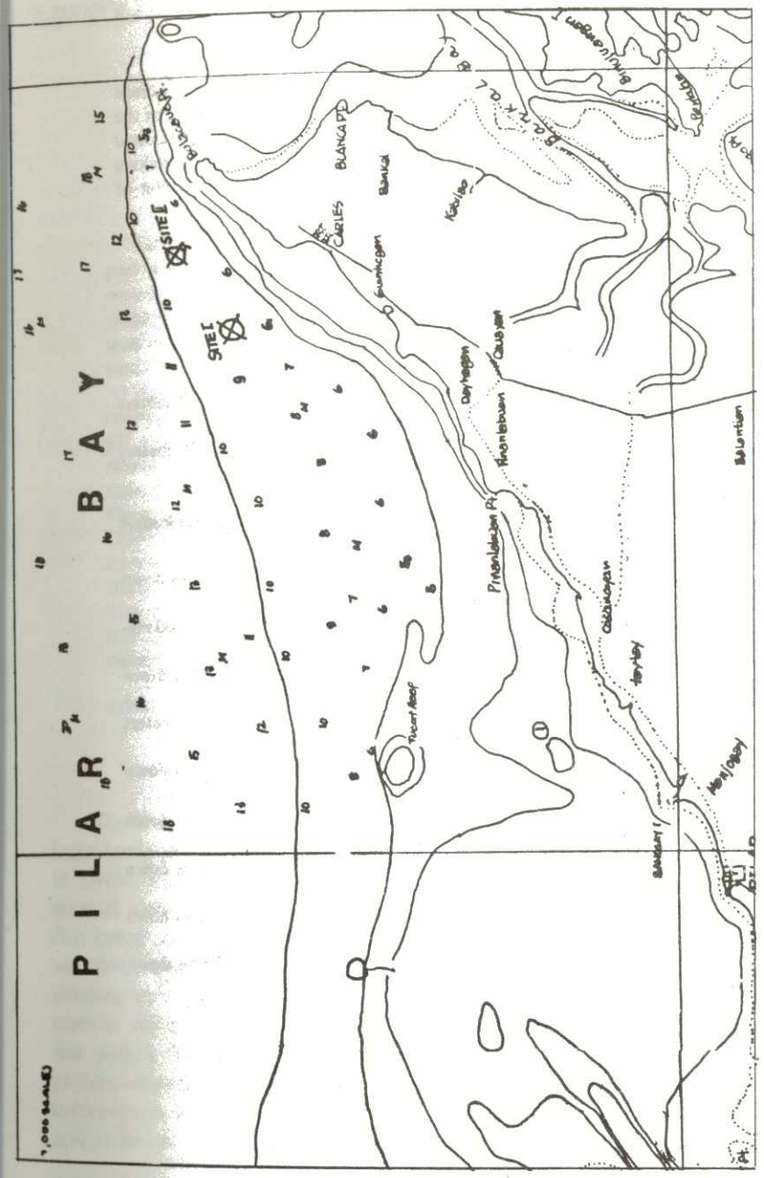


Fig. 12. Site of the modified fish corrals installed at Pilar Bay

APPENDIX

Materials Used for the Construction of Modified Fish Corral:

1. **Bamboo posts**

The modified fish corral is made of bamboo posts and ready made netting materials the size of which shall depend upon the depth of the water where it will be installed. The posts are made of well-seasoned bamboo poles, their bases are sharpened in order to facilitate staking them deeper in the mud. Holes are bored on the upper portion of every internode so that it would sink faster in water.

- 73 Posts – Collecting Crib (Ligaw)
- 163 Posts – Second Enclosure (Palibod)
- 458 Posts – First Enclosure (Tambahan)
- 200 Posts – Leader (Taktakon)

2. **Ropes used for floatlines, leadlines, riblines and breastlines:**

- 11 coils – rope, polyprophylene, 9mm diameter, 220 meters long, 3 strands, medium laid, blue.
- 30 coils – rope, polyprophylene, 8mm diameter, 220 meters long, 3 strands, medium laid, blue.

3. **Netting materials used for collecting crib, first and second enclosures and leader.**

- 9 rolls – net polyethylene, 400/15 x 16k x 100 meshes down x 100 meters long knotted black.
- 3 rolls – net, nylon, 0.55 x 12k x 100 meshes down x 100 meters long, knotted white.
- 11 rolls – net, polyethylene, 400/15 x 9k x 100 meshes down x 100 meters long knotted black.
- 3 rolls – net, nylon, 0.55 x 7k x 100 meshes down x 100 meters long, knotted white.
- 4 rolls – net, polyethylene, 400/18 x 5k x 100 meshes down x 100 meters long, knotted black.
- 6 rolls – net, polyethylene, 400/15 x 7k x 100 meshes down x 100 meters long, knotted black.
- 7 rolls – net, polyethylene, 400/15 x 9k x 100 meshes down x 100 meters long, knotted black.
- 4 rolls – net, polyethylene, 400/18 x 3k x 100 meshes down x 100 meters long, knotted black.
- 2 rolls – net, polyethylene, 400/18 x 5k x 100 meshes down x 100 meters long, knotted black.

4. **Lead weight used as sinkers:**

- 15 boxes – Lead weight, No. 5, 50 kgs per box.

5. **Mending twines and accessories:**

- 100 coils – Twine polyethylene, 400/18, black.
- 80 coils – Twine polyethylene, 400/15, black.
- 60 coils – Twine polyethylene, 400/12, black.
- 3 kgs – Twine kuralon, 20/15, white.