POND CULTURE OF SUGPO, P. monodon (Fabricius)*

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INTRODUCTION

The idea for the preparation of this manuscript on sugpo pond culture started during the series of lectures on the various aspects of pond management given by members of the research staff of the Aquaculture Department (Leganes Station) to fishpond caretakers, helpers, and other pond personnel from September to November 1975. One of the authors had previous extensive experience in managing a private fishpond. Work on the manuscript began in earnest in early 1976 after roughly a one-year stint in the Leganes pond system working with both experimental and production aspects of P. monodon cultivation.

Furthermore, preparation of this manuscript was made possible by the on-going series of seminars on Sugpo Pond Cultivation and the Fishpond Cooperators Program sponsored by the Training and Extension Division of the Department.

Although a result of many drafts, this work is not meant to be the final word on sugpo pond culture. It is intended to serve as a guide to fish farmers, extension workers and others in their initial efforts to produce marketable sugpo for local consumption or export. Suggestions on improvements will be welcome since such will be essential to future revision of this manuscript.

GENERAL CONSIDERATIONS

A sugpo pond should follow the various criteria for proper location, design and construction as described in numerous references

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published by the BFAR and other research organizations and experts in the field.

Moreover, the biology of this species demands specific requirements. As a crustacean, *P. monodon* grows only after molting during which it is highly vulnerable to predation and cannibalism. It is therefore essential to maintain a predator-free pond by appropriate pre-stocking treatments, e.g., pesticide application as well as sound pond management methods during the rearing period itself.

To avoid cannibalism, stress factors such as starvation and low oxygen that cause weakening of individuals must be minimized. To this end, a peripheral or diagonal canal in the pond can serve as refuge during high water temperatures and molting periods. The canal also facilitates water management and harvest.

Preliminary data indicate faster growth of sugpo in deeper ponds averaging one meter with lower salinities in the range of 10-20 ppt. A deeper pond means greater water volume available for feeding and other "living" necessities. At lower salinities, more of the energy intake is transformed into flesh by growth processes and less is diverted to osmoregulation or the body's salt-water balance.

Pond observations and surveys of coastal fry and adult prawn catches show that other species such as *P. merguiensis* (*hipong puti*), *P. semisulcatus* (*bulik*) and *Metapenaeus* spp. (*suahe*) abound in Philippine waters. Polyculture of these species together with *P. monodon* would maximize utilization of feeding niches in the pond provided there is little overlap in feeding habits of the different species.

Constant reference to Figs. 1-1d while reading the text will be helpful for time scale purposes.

POND PREPARATION

Drain the pond completely, soil-seal the gate (Fig. 2) and dry the pond bottom for approximately seven to nine days. While drying, undertake the following:

1. dike and canal repair;
2. cultivation and levelling of the pond bottom (optional);
3. screening of pond gate

a. bamboo screen with nylon facing canal
b. bamboo screen with nylon facing pond
c. nylon screen trap (*bulon*, Fig. 3) or bagnet (*lumpot*, Fig. 7) in pond during admission of water;
4. liming for acidic ponds (Appendix I);
5. organic pesticide application (Appendix I); and
6. organic fertilization. (Appendix III)

Admit initial water after organic pesticide and fertilizer have settled on pond bottom (from the 8th to the 10th day).

1. first day: 5 cm
2. second day: + 3 cm

Allow water evaporation and initiate *lablab* formation from the 9th to the 18th day. Drain water and raise to 10 cm. If *lablab* is poor, apply inorganic fertilizer (Appendix III), or scatter *lablab* gathered from other ponds.

Allow *lablab* to grow into maturity from the 18th to the 30th day.

Gradually drain all water from pond. Check for the presence of pest species like *Tilapia* which may have survived the initial draining and pesticide application. Any survivors must be eliminated as they will nest and lay eggs in the pond. Refill the pond and drain again once or twice.

Make a final water replenishment and raise water level to 15-25 cm.

STOCKING

The stocking time should be:

1. Before 9:00 a.m. and after 6:00 p.m. during sunny days, preferably in the morning;
2. Any time during cloudy days provided pond water temperature is low; and
3. Any time provided there is admisison of fresh tidal water into the pond.

The age of stock is: for postlarva P_{10} - P_{20}; younger stages may be stocked if healthy.

Table 1 shows the fry stocking density.

1. Stock manipulation with transfer:
   a. Nursery pond: 20-30/sq m
   b. Rearing pond: (see Transfer, next section)
2. One single pond with no transfers: 1-3/sq m.

Table 1. Stocking rates of sugpo following different rearing schemes.

	With Transfer	Without Transfer
Nursery pond	20-30 fry/sq m	monoculture: 1-3 sugpo fry/sq m
Rearing pond	monoculture: 0.5-2.0 sugpo juveniles/sq m polyculture: 0.5-1.0 sugpo juveniles/sq m 0.05-0.1 bangus fingerlings/sq m	polyculture: 1-2 sugpo fry/sq m 0.04-0.6 bangus fingerlings/sq m (2-3 months rearing period)

When the fry arrives, remove ice from the styrofoam containers, and select one container for actual (head) count before stocking. The remaining containers are for pond stocking.

The actual (head) counting follows this pattern:

1. Half fill four to five wide basins (diameter of at least 60 cm) with fresh pond water.
2. Remove the plastic bag from the styrofoam container, open and gradually add pond water to the bag.
3. Distribute the fry equally to the different basins.
4. Start the counting with at least two counters and one recorder for every basin.
5. Total no. of fry = no. counted for one styrofoam container x total no. of containers (assuming uniform density of fry in all styrofoam containers).
6. Fry already counted should be continuously collected and released immediately to the pond.

The remaining containers may be stocked using the following instructions:

1. Remove the plastic bags from the styrofoam containers.
2. Float the plastic bags in different parts of the pond for at least 30 minutes.
3. Open the bags and take the water temperature with a thermometer. Take the pond water temperature. (If no thermometer is available, dipping one's hand in the water will do.)
4. If the temperature difference is 2-3°C or less, release the fry immediately. Lower the edge of the plastic bag into the water and allow the fry to swim out slowly, moving the bag to scatter the fry.
5. If the temperature difference is 4-5°C or more, let the temperature equilibrate by gradually adding pond water to the plastic bag. Then release the fry as described above.
6. Direct stocking of fry in the pond is recommended over the use of temporary net enclosures as the *hapa* for acclimatization. The latter subjects the fry to unnecessary stress resulting from competition for space, food and other resources; individuals so weakened as well as those molting are better prey to cannibalism.

TRANSFER FROM NURSERY POND TO REARING POND

The required water conditions for transfer are the same as those for stocking (see section on Stocking). The size of stock ranges from 2-5 g (30-45 days in nursery pond). The stocking density (Table 1) is as follows:

for monoculture: 0.5-2.0 sugpo juveniles/sq m and
for polyculture: 0.5-1.0 sugpo juveniles/sq m:
0.05-0.1 bangus fingerlings/sq m
(or 5,000-10,000 sugpo juveniles/ha to 500-1,000 bangus fingerlings/ha)

A. METHODS

1. Shrimp trap or *bakikong* (Fig. 4)
   a. Install the *bakikong* along the dike 2-5 m from the pond gate.
   b. Gradually reduce water level to half depth 2-3 hours before the incoming high tide in the evening.
   c. Admit fresh tidal water.
   d. Install a gas lamp above the catching chamber to attract the prawns at night.
   e. The following day, catch the juvenile prawns inside the trap by means of a scoop net.
   f. Carry by pail or float by shrimp cage (Fig. 5) or suspension net (Fig. 6) to the rearing pond over short distances.

2. Bagnet or *lumpot* (Fig. 7)
   a. Slightly decrease water level 2-3 hours before the incoming high tide late in the afternoon or evening.
   b. Admit fresh tidal water and allow maximum entrance.
   c. Operate the bagnet (Fig. 7) immediately in the evening as soon as the tide recedes. The ideal time for bagnet operation is between 6:00-7:00 o'clock p.m., during the new moon period of spring tide.
   d. Deliver the stock by pail, shrimp cage or suspension net to the rearing pond.

3. Catching pond method.
   a. Remove all gate screens and flashboards from the pond gate.
   b. Reduce water level to half depth in the late afternoon or evening.
   c. Admit fresh water in the afternoon or evening.
   d. Partially drain water in the evening to allow stock to enter the catching pond.
   e. Return gate screen to the pond gate. Replenish water if needed early the following day.

f. Catch the juveniles inside the catching pond by scoop net or seine net early the following morning before the shallow water gets too hot.
g. Deliver by pail, shrimp cage, or suspension net to the rearing pond.

4. Manual method (for complete harvest)
   a. Reduce stock by methods described above.
   b. Reduce water to the level of the peripheral canal by draining slowly.
   c. Catch remaining stock in canal by means of seine net (Fig. 8), scissors net (Fig. 9) or dredge net (Fig. 10).
   d. Reduce water in the peripheral canal to half depth.
   e. Handpick remaining shrimp.

REARING

In rearing, water management with emphasis on the depth of water, is a primary consideration.

The nursery pond, 20-25 cm at stocking time, is gradually raised by 10 cm every spring tide to a maximum of 60 cm; *lablab* feeding is used.

On the other hand, the rearing pond, 30-35 cm at stocking time, is gradually raised by 10 cm every spring tide to a maximum of 110 cm; *lablab* or plankton and supplementary feeding used.

Water replenishment every spring tide is done through the following:

a. Decrease water level a few hours before incoming tide can enter the pond. Then admit fresh tidal water.
b. Repeat the above procedure of draining-refilling two or more times.
c. Without draining, admit fresh tidal water into the pond.
d. Allow fresh tidal water a second time to the desired level without draining.
e. Water replenishment should average five days (three draining-refilling + two filling) every spring tide.

Replenish water under stress conditions (low dissolved oxygen, high water temperature, kill fish); during neap tide, use a water pump. Prawns seen swimming at the surface during daylight hours are in stress.

During hot days or in the early morning when dissolved oxygen is low, circulate the water with the use of a water pump or other means.

After moderate to heavy rains, allow water to overflow by draining the top layer of the pond. Immediately replace with fresh tidal water or by means of a water pump.

During neap tide, soil-seal the gate (Fig. 2) once the desired pond water depth and conditions are attained to prevent seepage of water.

Undertake daily maintenance of dikes to fill up crab holes and prevent water seepage.

Rearing also includes methods of natural feeding such as:

1. *Lablab*
   a. Install dried twigs at an average of one/10 sq m or 1,000/ha for shelter of the growing prawns as well as to prevent the accumulation of *lablab* at the sides of the pond. Place the twigs horizontally in rows perpendicular to the prevailing wind direction. Old coconut leaves and bamboo branches are effective substitutes.
   b. Reduction of water (prior to replenishment) should be gradual to conserve *lablab* and done late in the evening or early morning when water temperature is low.
   c. If *lablab* growth is significantly decreased during rearing, start supplementary feeding.
2. Plankton method
   a. This method is used in the rearing pond with a water depth of 60-110 cm.
   b. Apply inorganic fertilizer after water replenishment during spring tide. Do not drain water until the 12th-14th day. Replenish water and repeat application.
3. *Lumut*
   a. If undesirable filamentous algae or *lumut* become excessive, harvest manually to prevent prawns from getting entangled and trapped in the mats of algae.

b. Soften the algae by sun drying for a few days for use as feed in the same pond or in bangus ponds.

Supplementary feeding is also done, (5 g to harvestable size, as sugpo grow bigger, they become more carnivorous in diet).

Sugpo may be fed with fresh trash fish from ponds (*bidbid, buan-buan, tilapia,* etc.), mussel meat or *tahong,* shrimp heads, animal skins, and other meat sources that are readily available and not used as human food.

The amount of feeding is 5-10% of estimated body weight of population in pond (Appendix IV).

The food is chopped into cubes ranging from 0.5 to 1.0 cm in diameter using smaller sizes for the earlier sugpo stages.

Feeding may be done daily or once every two days in the late afternoon or early evening. Distribute throughout the pond; to reach the center of the pond, construct a catwalk if necessary.

HARVEST

Sugpo may be harvested when they reach this size: 15-30 pcs/kg or 30-60 g each (4-6 months in the rearing pond) with 10-25 ppt salinity range; growth is slower at higher salinities).

Harvesting may be done on three successive days or nights by means of the shrimp trap, bagnet or catching pond method. There should be immediate refilling of the pond if the bagnet and catching pond methods are used.

On the fourth day, final harvesting may be done by reducing water to the level of the peripheral canal and handpicking remaining prawns.

PROCESSING AND TRANSPORT

The following steps in processing and transport should be done in the shortest possible time with great care and minimum handling to lessen spoilage and preserve quality.

1. Immediately after harvest, sort according to size. If for export, follow standard sizes and remove heads to reduce bacterial count, discoloration, and storage space requirement. Beheading at the harvest site is preferable because it reduces the amount of ice needed. Heads can be fed to shrimps in other ponds.

2. Place in ice with close contact provided by thin alternate layers of ice and prawn. Maximum depth of ice and shrimp in a container should not be more than two to three feet (60-90 cm) to prevent bruising of bottom layers.

3. Transport containers to open markets or supermarkets for local consumption or to a processing plant for further treatment if for export purposes.

Appendix I

CONTROL OF PESTS AND PREDATORS

Pests and predators may be treated mechanically through the following:

1. Thorough draining and drying of ponds two to three times generally eradicates most unwanted fish species (*Tilapia* spp., *Elops hawaiiensis, Megalops cyprinoides, Lates calcarifer, Therapon* spp., gobies, etc.).
2. Women and children are hired to manually harvest snails (Family Cerithidae) to provide income to local people.
3. Snails that concentrate along the water line or in puddles may also be collected by shovels or rakes.
4. Regular maintenance of gates and dikes reduces harmful effects of barnacles and crabs, respectively.
5. Installation of gate screens (bamboo and nylon), bagnet, etc., prevents the entry of most unwanted species during the admission of pond water.

Chemical treatment may also be undertaken. Emphasis is on prestocking applications and on biodegradable organic pesticides which also serve to fertilize the ponds.

Throughout a drained but moist pond bottom, uniformly spread any of the following:

1. commercial nicotine at 12-15 kg/ha or tobacco waste (dust, stalks, etc.) at 200-400 kg/ha to eradicate fish and snails;
2. commercial saponin at 15-20 kg/ha or tea seed cake (residue of *Camellia* spp. after oil extraction) at 150-200 kg/ha to eradicate fish, snails and crabs,
3. quicklime (CaO) at 100-600 kg/ha to eradicate unwanted fish. Milk of lime is a thick solution prepared by dissolving quicklime in water; it is applied in pools and other watered portions containing fish. For pond conditioning, particularly in acidic ponds, the dosage may be raised to 1,000-2,000 kg/ha.

After one to two days, apply organic fertilizer.

Allow the organic materials to settle in the soil for four or five days.

Admit initial water 5-8 cm in depth.

Remaining unwanted animals may be completely eliminated by applying saponin at 0.5 ppm (0.4 kg/ha at 8 cm water depth), and Bayluscide (niclosamine) at 3-5 ppm (3.2 liters at 8 cm water depth).

Three days after poisoning, raise water to 15-25 cm.

Change water completely two times and stock the pond after one to two weeks.

Commercially prepared *derris* powder (5-8% rotenone) may be applied before stocking in a partially watered pond at one ppm (0.8 kg/ha) to four ppm (3.2 kg/ha) at 8 cm water depth. If the commercial product is not available, prepare *derris* powder from *tubli* and other local plants.

Sun dry the roots for one week. The rest of the plant may be replanted like camote cuttings.

Cut dried roots into pieces and soak in water overnight.

Remove wet roots and pound thoroughly.

Soak in water again and agitate to get rotenone into solution.

Apply solution to the pond. The solution from four kg *derris* roots is sufficient to treat one ha at 8 cm water depth.

Appendix II

DISEASES

The most important microorganisms that cause disease in pond-reared sugpo are *chitinoverous* bacteria that feed on the exoskeleton and *ectocommensal* protozoa that attach to surfaces, including gills. If the latter are abundant on gill filaments, they decrease oxygen uptake and gradually weaken the prawns.

Diseased prawns are characterized by:

blackening of areas of the exoskeleton,

falling off of parts of the walking legs and breaks in the uropods and other exoskeletal parts,

dull luster of the exoskeleton, and
sluggish behavior.

Prevention and/or reduction of diseases may be accomplished by frequent change of pond water, and not overfeeding. Excess food accumulates and decomposes on the pond bottom, providing a favorable habitat for microorganisms.

Appendix III

FERTILIZATION

Organic fertilization may be done one to two days after application of tobacco dust (or other organic pesticides) in a drained pond by spreading dried chicken dung throughout the pond bottom at 1,000-3,000 kg/ha.

Other organic manures such as carabao and horse dung and composted hay may also be used.

Pesticides and fertilizers should be allowed to settle in the soil for four to five days. Initial water 5-8 cm deep should be admitted.

Inorganic fertilization may be applied for *lablab* growth, pond preparation by broadcasting 100 kg (4 bags/ha) of 18-46-0 or 200 kg (8 bags/ha) of 16-20-0 inorganic fertilizer.

For plankton growth, water should be at least 60 cm deep.

A square platform is constructed using bamboo or wood with 0.75 sq m of platform surface for each hectare of water. The platform surface must be 15-20 cm below the water surface.

Apply 22 kg (approximately ½ bag/ha) of 18-46-0 or 50 kg (1 bag/ha) of 16-20-0 fertilizer on the platform immediately following admission of water to 60 cm depth in the pond.

This application may be repeated after every water change or as needed.

Appendix IV

ESTIMATE OF RATE OF SUPPLEMENTARY FEEDING

To estimate the rate of supplementary feeding:

a. Fill a 25-1 pail with pond water half to three-quarters level, and weigh to the nearest 10 grams or to the nearest gram.

b. Get a sample of at least 30 prawns from a *bakikong* and place in a pail. The pail, water and prawns are weighed. The handling of stock and other causes of stress are minimized. The stock is immediately returned to the pond.

c. Calculate as follows:

average body weight

$$(\text{ABW})\ (\text{g}) = \frac{(\text{wt. pail} + \text{water} + \text{shrimp}) - (\text{wt. pail} + \text{water})}{30}$$

estimated wt. of shrimp in pond (g or kg) = ABW x initial stock no. x estimated % survival

survival = 50% from fry to juveniles
70-90% from juveniles to harvest size

amount of supplementary feed (g or kg) = estimated weight of shrimp x 5-10%

(Divide into two portions if feeding is twice daily.)

d. Take the sample at monthly intervals and adjust feeding rates accordingly.

e. Adjust the feeding rate if stock appears to be underfed (thin) or overfed (accumulation of excess food in pond bottom).

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BIBLIOGRAPHY

BALISTA, C.D. and I.S. FERNANDEZ
1973 Handling and processing shrimps for export. Bureau of Fisheries and Aquatic Resources leaflet. (mimeo).

BARDACH, J.E., J.A. RYTHER, and W.O. MCLARNEY
1972 Aquaculture: The farming and husbandry of freshwater and marine organisms. Wiley-Interscience, London.

CACES-BORJA, P. and S.B. RASALAN
1968 A review of the culture of sugpo, *Penaeus monodon* Fabricius, in the Philippines. Proc. World Scientific Conference on the Biology and Culture of Shrimps and Prawns. Mexico City, Mexico. 12-21 June 1967. FAO Fish. Report 57(2) 111-124.

DELMENDO, M.N. and H.R. RABANAL
1955 Rate of growth of the Sugpo (Jumbo Tiger Shrimp), *P. monodon* Fabricius, with notes on its culture in brackishwater ponds. Proc. 2nd Indo-Pacific Fisheries Council Meeting. 6:424-431.

DJAJADIREDJA, R.
1957 A preliminary report on the introduction of the Philippine-type nursery in Indonesia. Tech. Pap. Indo-Pacif. Fish. Counc. IPFC/C57/Tech./17, 23 pp. (mimeo).

HICKLING, C.F.
1962 Fish culture. Faber and Faber, London.

LARA, D.B. G.
1976 A contribution to the identification of some pathogenic agents causing diseases in shrimps, *Penaeus monodon* Fabricius (Sugpo) in the Philippines (manuscript).

LOPEZ, J.V.
Present status and problems of prawn culture in the Philippines. Bureau of Fisheries and Aquatic Resources. (mimeo).

MOTOH, H., O. PARAAN, E. BORLONGAN, E. CALIGDONG and G. NALZARO
1976 Ecological survey of penaeid shrimps of Batan Bay and its adjacent waters II. Aquaculture Department, SEAFDEC, Tigbauan, Iloilo, 64 pp. (mimeo).

MSU-SCTO-NSDB Marine Fisheries Research Staff
Sugpo farming. Naawan, Misamis Oriental. (mimeo).

PADLAN, P.G., B.S. RANOEMIHARDJO and E. HAMAMI
1975 Improved methods of milkfish culture I. Increasing production in shallow, undrainable ponds. Bull. Shrimp Culture Res. Centre. 1:33-39.

PHILIPPINE COUNCIL FOR AGRICULTURE AND RESOURCES RESEARCH.
The Philippines recommends for inland fisheries: Sugpo (Penaeus monodon) culture. (mimeo).

PHILIPPINES. UNIVERSITY. INLAND FISHERIES PROJECT (IFP).
1974 Combination bangus-shrimp culture. Tech. Report. Diliman, Quezon City, Metro-Manila. 4:9-11.

PHILIPPINES. UNIVERSITY. INLAND FISHERIES PROJECT (IFP).
1975 Monoculture and polyculture of bangus ponds. Tech. Report. Diliman, Quezon City, Metro-Manila. 6: 19-30.

PRIMAVERA, J.H.
1976 Survival rates of different *Penaeus monodon* Fabricius postlarval stages. Aquaculture Department, SEAFDEC (manuscript).

PRIMAVERA, J.H., F. APUD and C. USIGAN
1976 Effect of different stocking densities on survival and growth rates of sugpo, *Penaeus monodon* Fabricius, in a milkfish rearing pond. Aquaculture Department, SEAFDEC. (manuscript).

SANTIAGO, A. JR., J. LLOBRERA, A. SANCHEZ and A. LLOBRERA
1975 Preliminary studies on the monoculture of *Penaeus monodon* Fabricius II. Materials for Training in Prawn Culture. Aquaculture Department, SEAFDEC, Iloilo, Phil. (mimeo).

SILLS, J.B.
1974 A review of the literature on the use of lime (Ca $(OH)_2$, CaO, $CaCO_3$) in fisheries. U.S. Dept. of the Interior. Fish and Wildlife Service. 12 pp. (mimeo).

VILLADOLID, D.V. and D.K. VILLALUZ
1951 The cultivation of Sugpo (*Penaeus monodon* Fabricius) in the Philippines. Phil. Jour. Fish. 1:55-65.

VILLALUZ, D.K.
1953 Fish farming in the Philippines. Bookman, Manila.

VILLALUZ, D.K., A. VILLALUZ, B. LADRERA, M. SHEIK and A. GONZAGA
1972 Reproduction, larval development and cultivation of sugpo (*Penaeus monodon* Fabricius). Phil. Jour. Sci. 98:205-234.

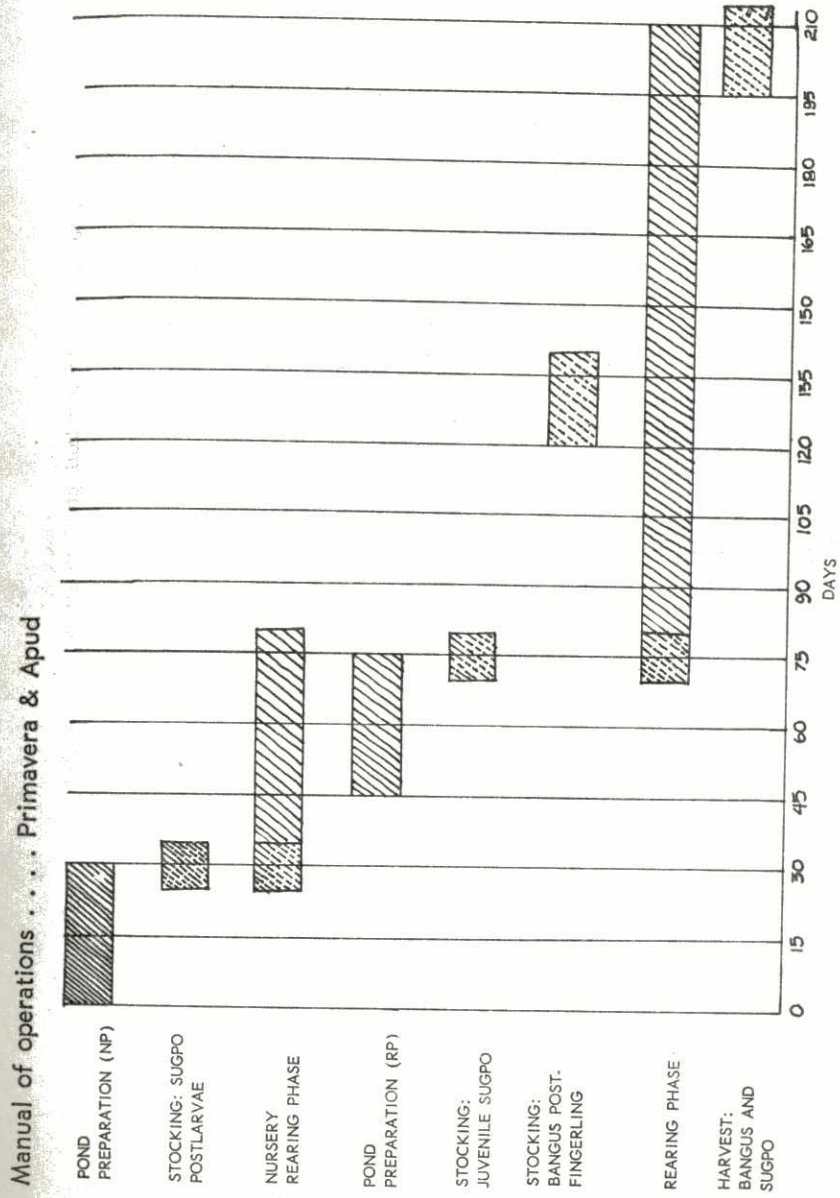

Figure 1. Sugpo-bangus polyculture in ponds.

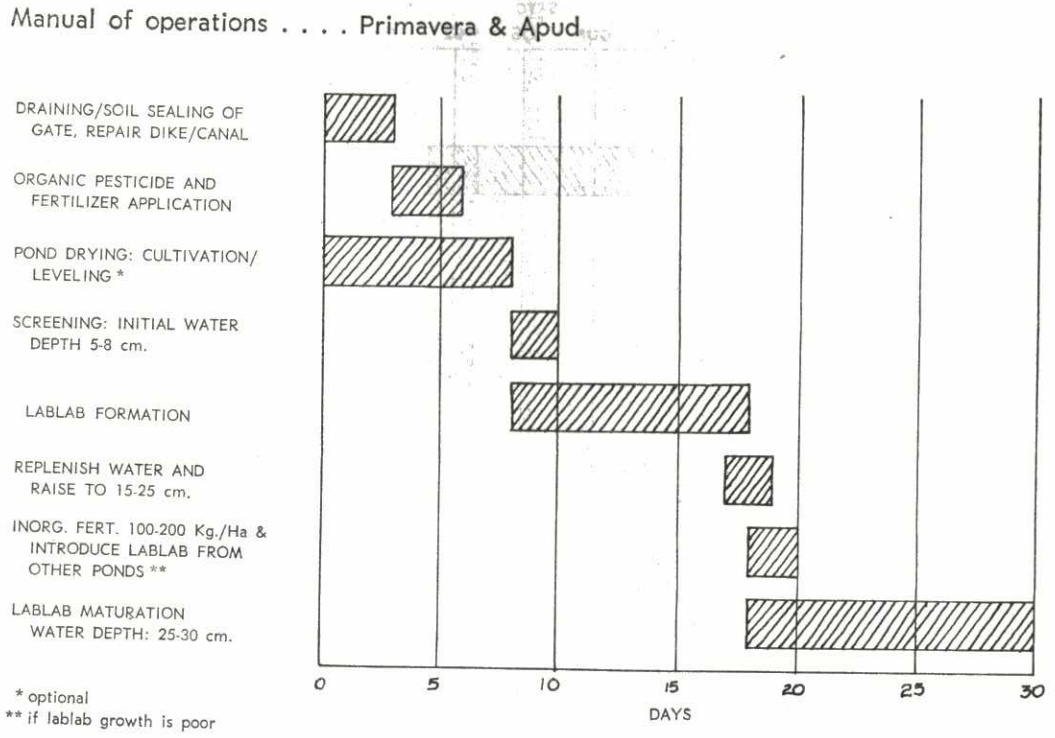

Figure 1a. Details of pond preparation (lablab method)

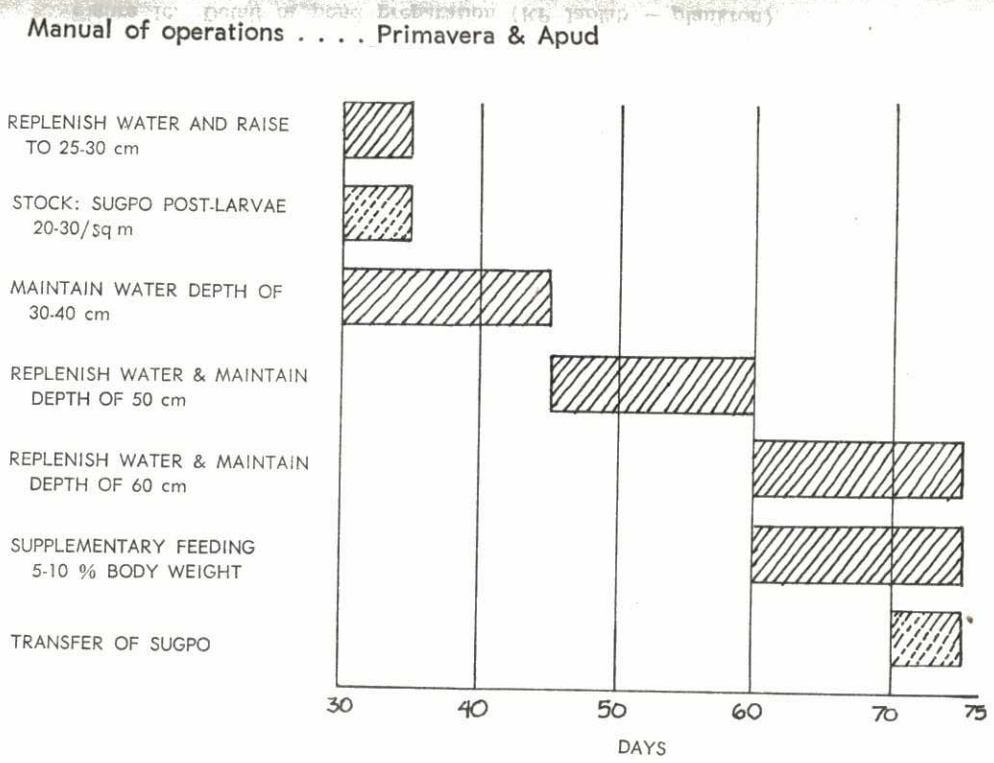

Figure 1b. Details of nursery rearing phase.

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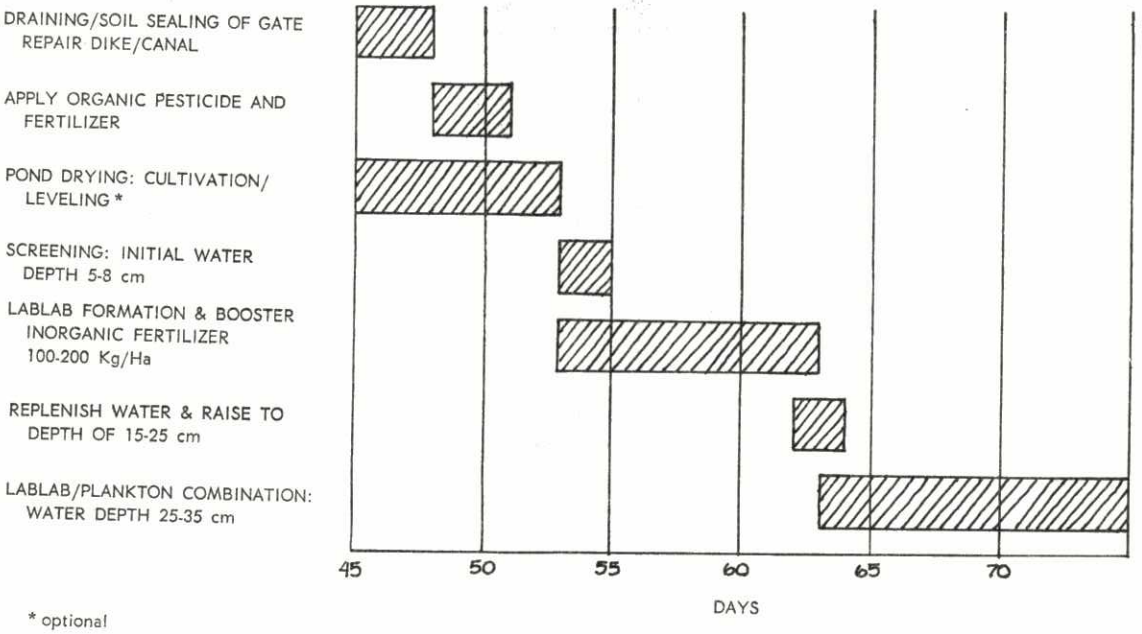

Figure 1c. Detail of pond preparation (RP lablab — plankton)

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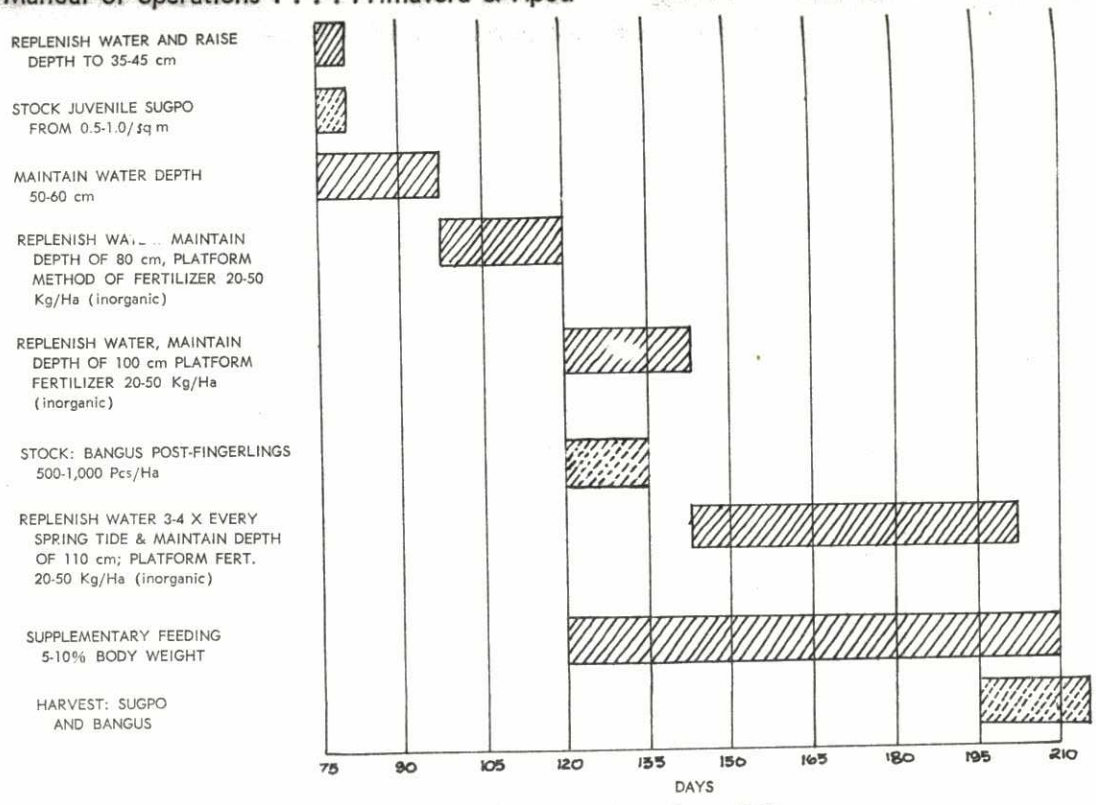

Figure 1d. Details of rearing phase (RP)

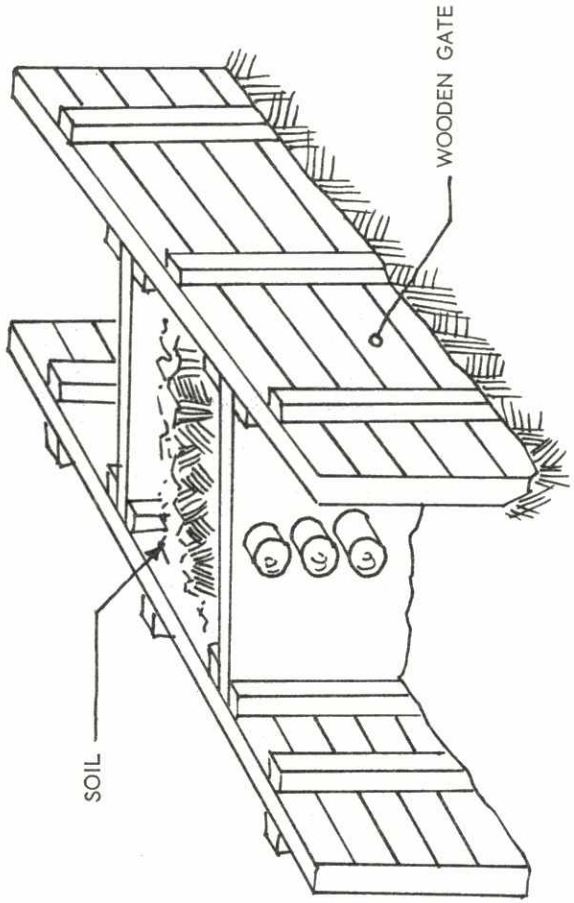

Figure 2. Soil sealing of pond gate

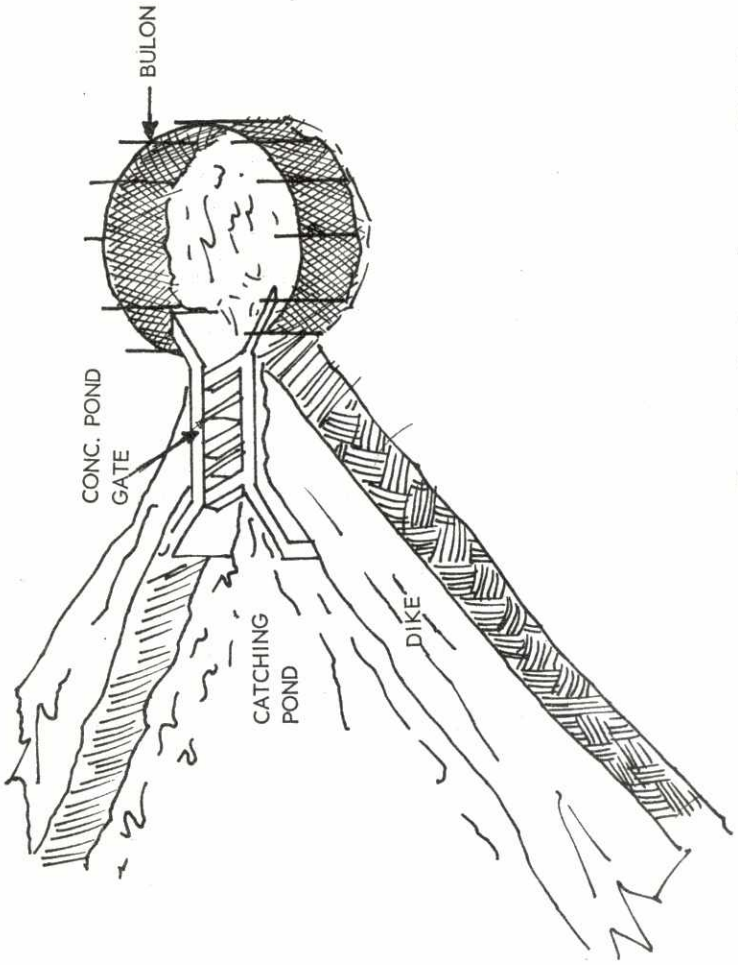

Figure 3. Circular nylon screen (Bulon)

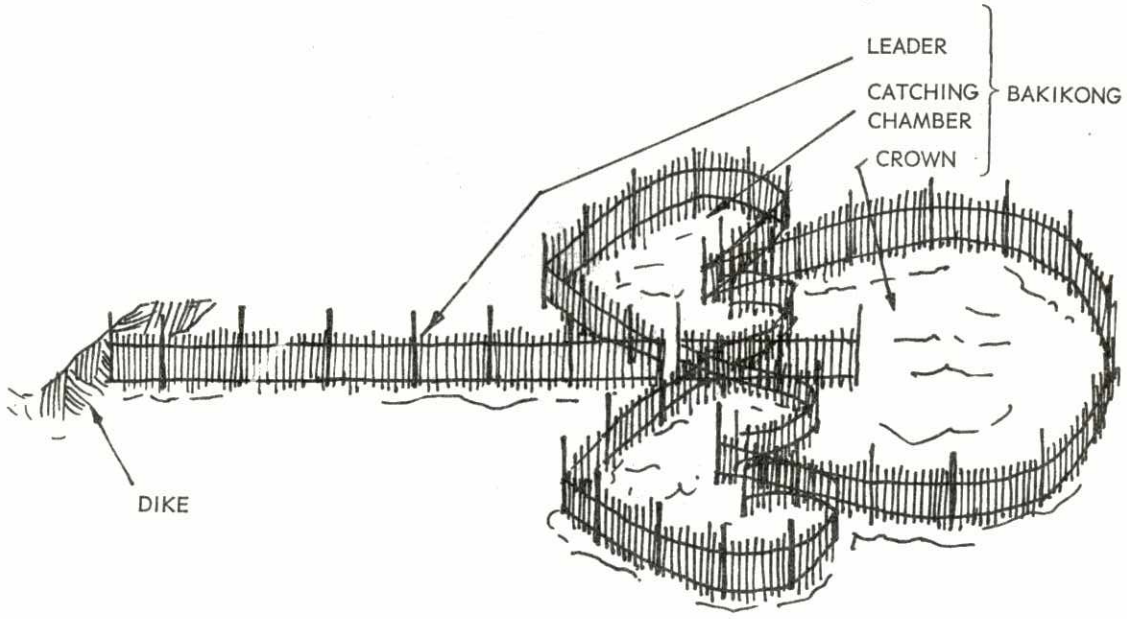

Figure 4. Bamboo shrimp trap (Bakikong)

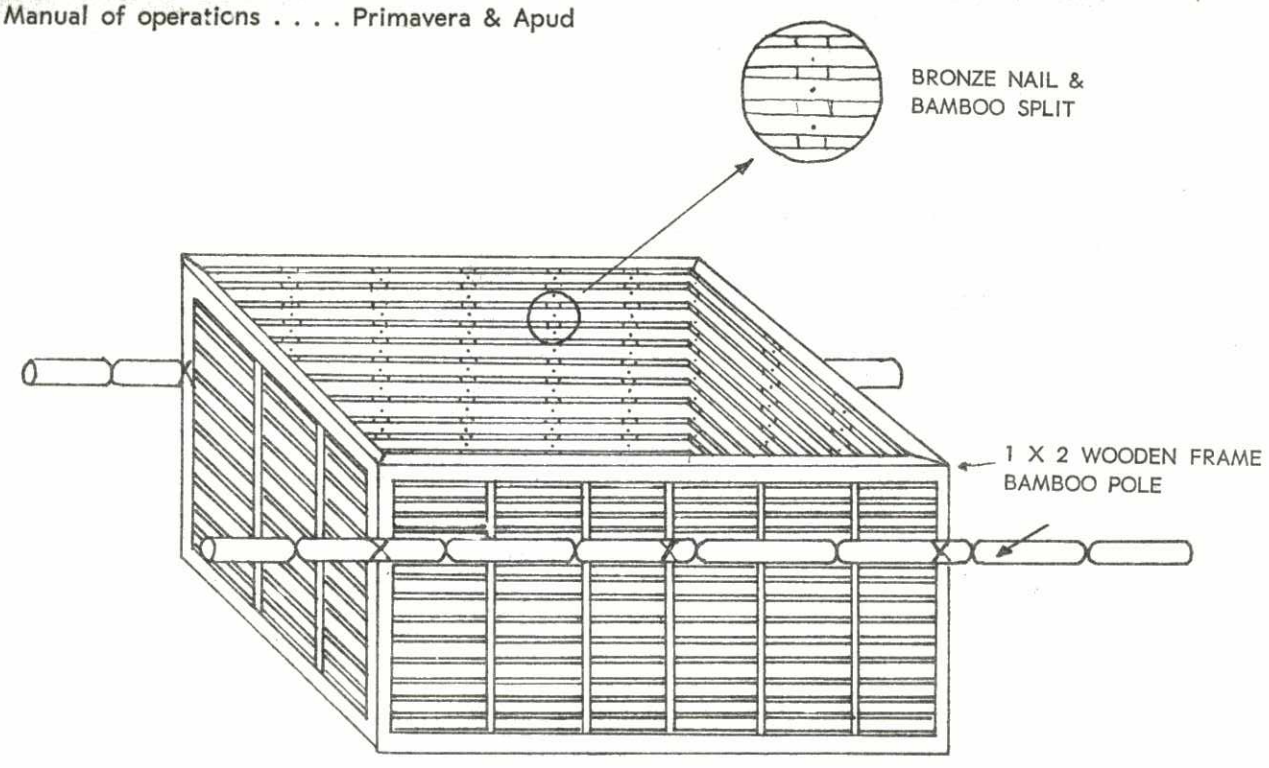

Figure 5. Bamboo cage for transport of juvenile or adult sugpo.

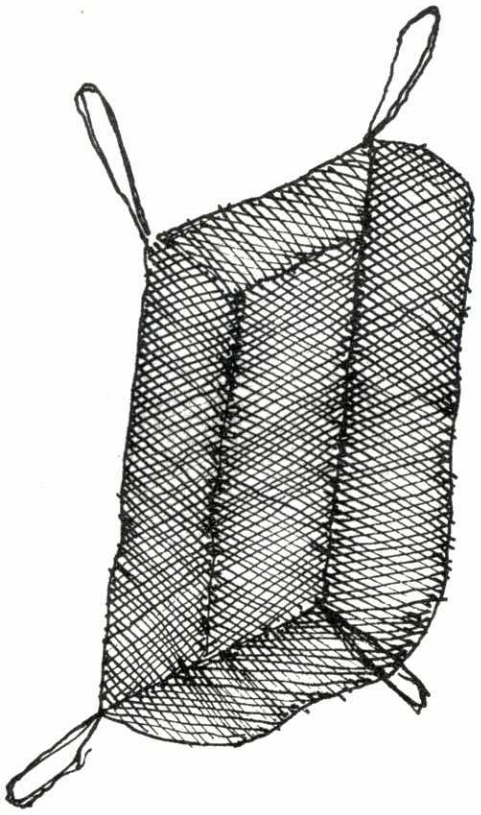

Figure 6. Suspension net (Bitinan)

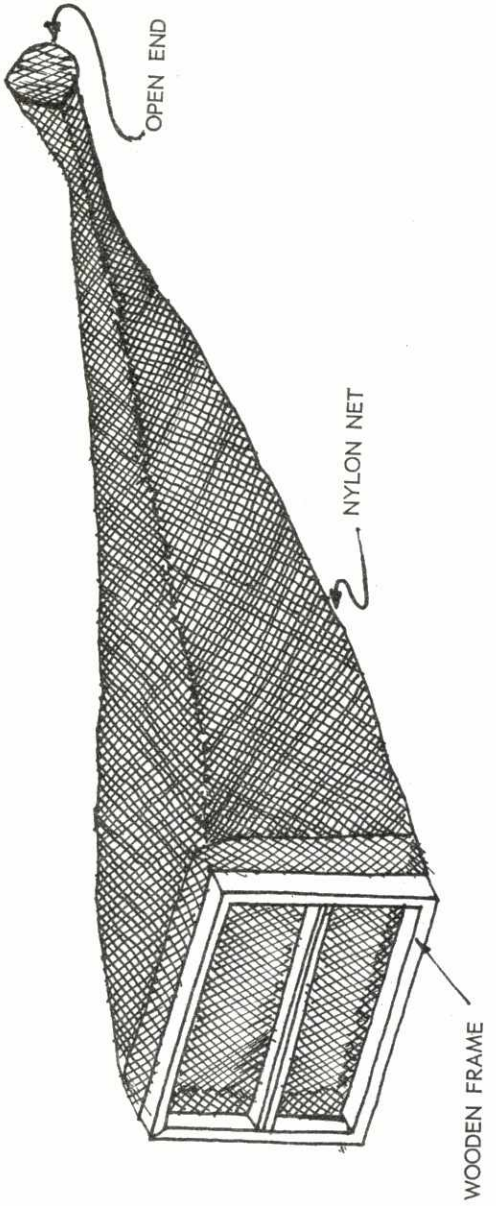

Figure 7. Bagnet (Lumpot) attached to a wooden frame.

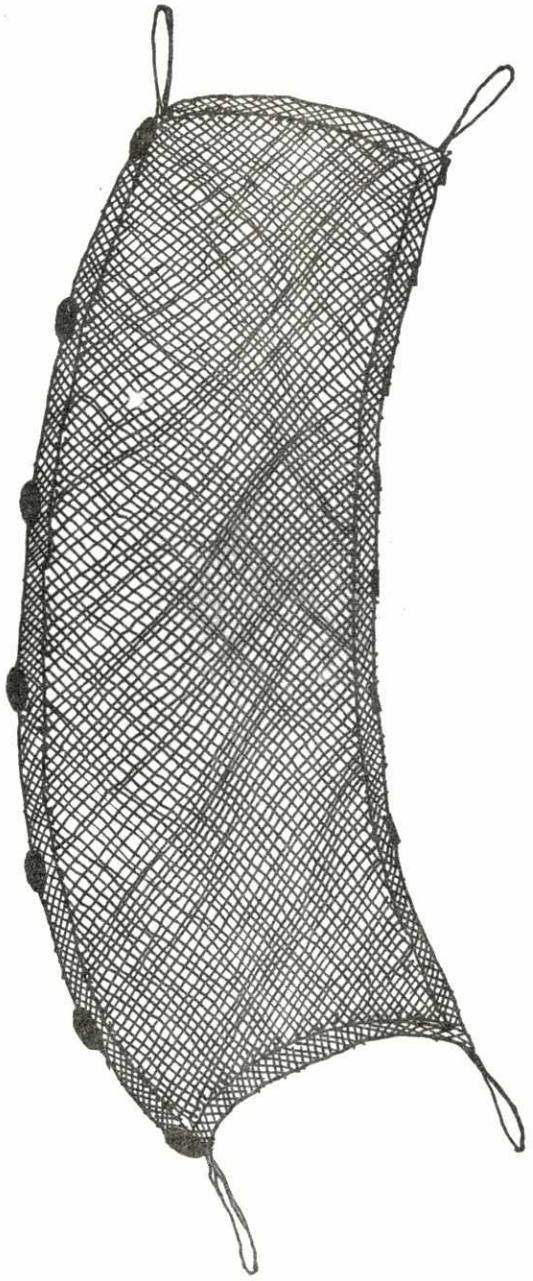

Figure 8. Seine Net

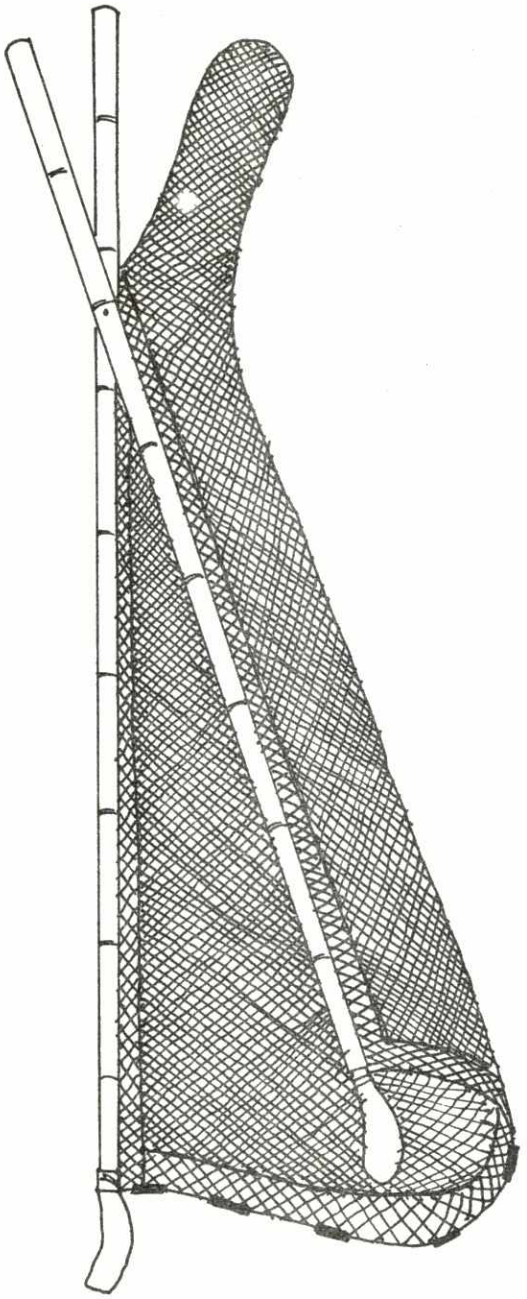

Figure 9. Scissor net

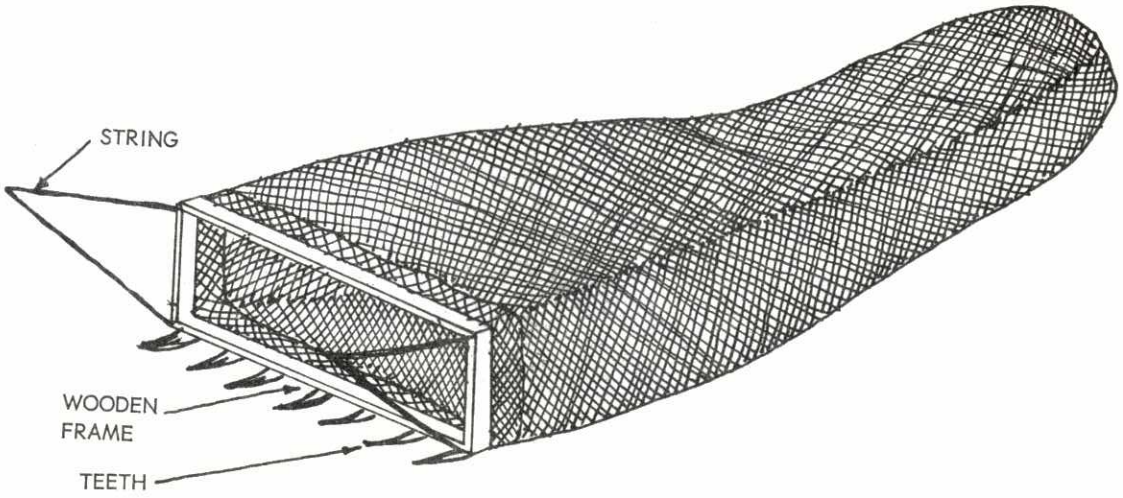

Figure 10. Dredge net