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As of April, 1983, there were three sites of mussel culture in Western Samoa. The three sites are Apia, Safata, and Asau. (For information prior to April, 1983, please refer to the April report of the Fisheries Division on this project.)

1. Apia

The mussel rafts anchored behind the fisheries center in Apia were taken out of the water and dismantled on 22 June 1983. Approximately 220 mussels remained from the first lot of 30,000 spat introduced to Samoa from Tahiti in June 1982. From a sample of 175 mussels, the growth rate averaged a low 0.26 cm/month. The wet flesh averaged 27% of the whole unopened mussel by weight, and the shell to wet flesh weight ratio was 2:1. There was little visible sexual differentiation (less than 10% of the sample was recognizable, and the female to male ratio was 4:1). They have received sufficient food in Apia bay to spawn naturally. Collector rafts were placed in the bay

2. Safata of July to see if, in fact, no mussels can be cultured at

2.1 Water Conditions. The water conditions are as they were in the last report with the exception of an overall 1-2 C drop in water temperature. Currently the water is 29-30 C in the bay in Safata. Salinity in the bay changes with incoming and outgoing tides. At low tide in 1m of water, a surface salinity of 24ppt was measured while a salinity of 29ppt was measured on the bottom. Copepods dominated an early June plankton sample.

2.2 Raft Culture. There are two rafts in the Safata bay in about 2-2½ meters of water. There are approximately 500 mussels remaining on raft 1 and about 3,000 remaining on raft 2. Losses have been attributed to poor attachment and to human intervention. Since the arrival of these mussels from Tahiti in February, 1983, the growth rate averages 0.9 cm/month. The average length of the mussels in early June was 4.6 cm. (see fig. 1). The wet flesh of the mussels is an average of 41% of the whole mussel weight. The sexes of these mussels is distinguishable, but the gonads are not yet ripened for spawning.

2.3 Tray Culture. The other mussels in Safata bay are being cultured in trays in 1 meter of water. The average size of the mussels on the three 1X1.5m trays is 4.9 cm. This growth represents 1.0 cm/month since the spat arrived in February. (see fig. 2). The meat content averages 44% (wet flesh) in these mussels. The sexes are also distinguishable but not ripe.

It is felt that this tray method has great potential in Safata bay — an area which is very productive but not very deep. Crabs, however, (*Thalassidroma* sp. and *Scylla* sp.) and settlement of silt on the trays continue to be problematic. These problems can be dealt with in future tray designs. The area also has potential for village-based mariculture projects.

3. Asau

3.1 Water Conditions. The Asau site continues to show outstanding results. The range of water temperature data is lower in the past month — a surface reading as low as 26°C was recorded at a mid-June reading (temperatures had heretofore been in the 28-31°C range on the surface.) A dinoflagellate bloom also occurred in mid-June. There were no ill effects on fisheries personnel who consumed raw mussels sampled from this time before they were informed of the water conditions. Otherwise, the plankton population shows diatoms, copepods, barnacle larvae, some bivalve larvae (unidentified), crustacean larvae, and fish eggs and larvae.

3.2 Raft Culture. There are two culture rafts in Asau bay with an estimated 20,000-25,000 mussels on the ropes hanging three meters below these rafts. One raft was originally anchored close to a shipping lane, so it was moved to the same location as the first raft in early May. The average length of the mussels

is 6.9 cm which represents 1.4 cm/month growth since the mussels were imported in February, 1983, at an average length of 1.2 cm (see figure 3). This growth rate, though somewhat slower than earlier reported, is still faster than any other Asian or Pacific country. (Davy and Graham, ed., 1982)

The meat quantity is also comparable to other results at this marketable size. The wet flesh is an average of 36% of the whole unopened mussel weight which is slightly lower than in the Philippines (Davy and Graham, ed, 1982). The average wet flesh weight is 7.9g, and the average unopened mussel weight is 21g or 22 mussels per pound. The average shell to wet flesh ratio is 1:1, the same ratio as the green mussels cultured in India (Davy and Graham, ed, 1982). The cooked flesh averages 20% of the whole mussel weight with a range of 16% to 28% as compared to the Philippines where the range is 12% to 33%. (Davy and Graham, ed., 1982).

The gonadal condition of the mussels is ripe. Mussels showed full, ripe gonads, the contents of which flowed when pricked open. Microscopic inspection of these contents showed vigorous sperm and apparently ripe eggs. Some of the mussels in the sample spawned on the trip from Asau to the laboratory in Apia. It is not certain at this point whether they have received sufficient stimulation in Asau bay to spawn naturally. Collector rafts were placed in the bay on the first of July to see if, in fact, any spats can be obtained in this way. (see figure 4).

Future plans call for a harvest in August for marketability testing. Another importation of mussel spat is also being planned to better establish the mussels in Asau bay.

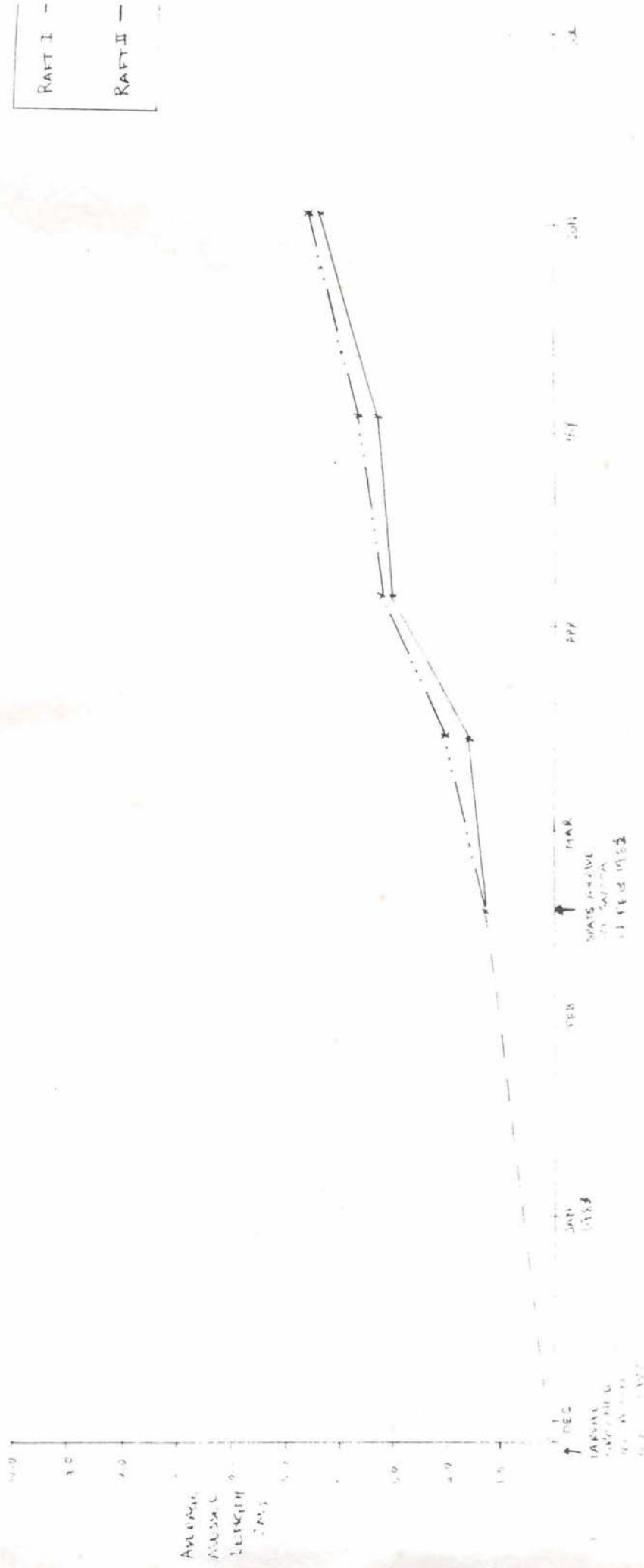
REFERENCES:

Davy, F.B. and Graham, M. ed. Bivalve in Asia and the Pacific Proceedings of a workshop held in Singapore. 16-19 February, 1982. Ottawa, Ont., IDRC, 1982. 90p.:ill.

FIGURES:

1. Growth: Safata Rafts
2. Growth: Safata Trays
3. Growth: Asau Rafts
4. Collector Raft Design

Figure 1
 AVERAGE GROWTH - SAVANNA RAFTS
 FEBRUARY - JUNE 1953



Average
 RAFT
 LENGTH
 (CM)

↑ FEB
 RAFTS RECOVERED
 IN SAVANNA
 FEB 1953

JUN
 1953

MAR

↑ MAR
 STARTS RAFTS
 IN SAVANNA
 FEB 1953

APR

MAY

JUN

RAFT I -
 RAFT II -

FIGURE 2.
 AVERAGE GROWTH: SAFATA TRAYS
 FEBRUARY - JUNE 1983

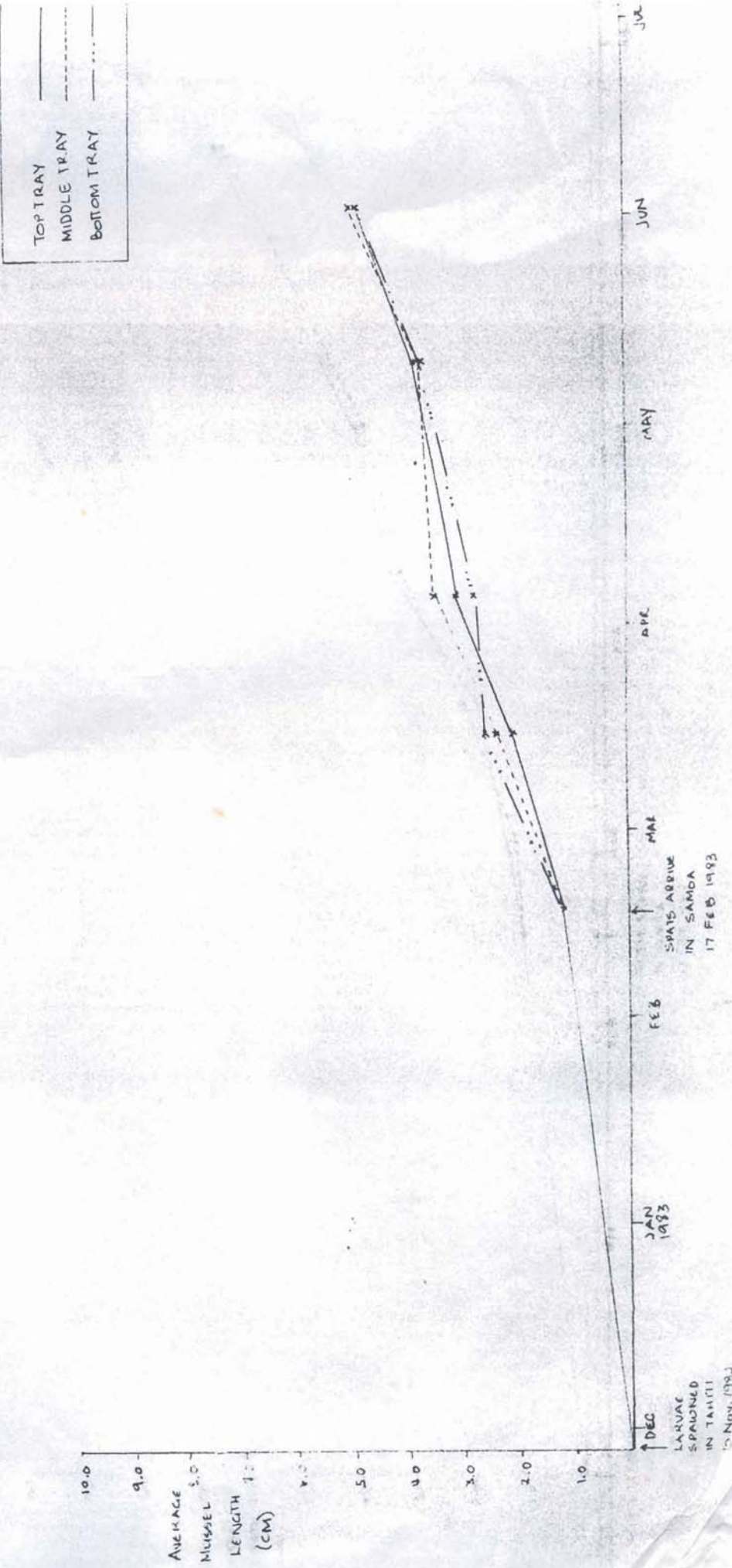


FIGURE 3
 AVERAGE GROWTH : ASAU RAFTS
 FEBRUARY - JUNE 1983

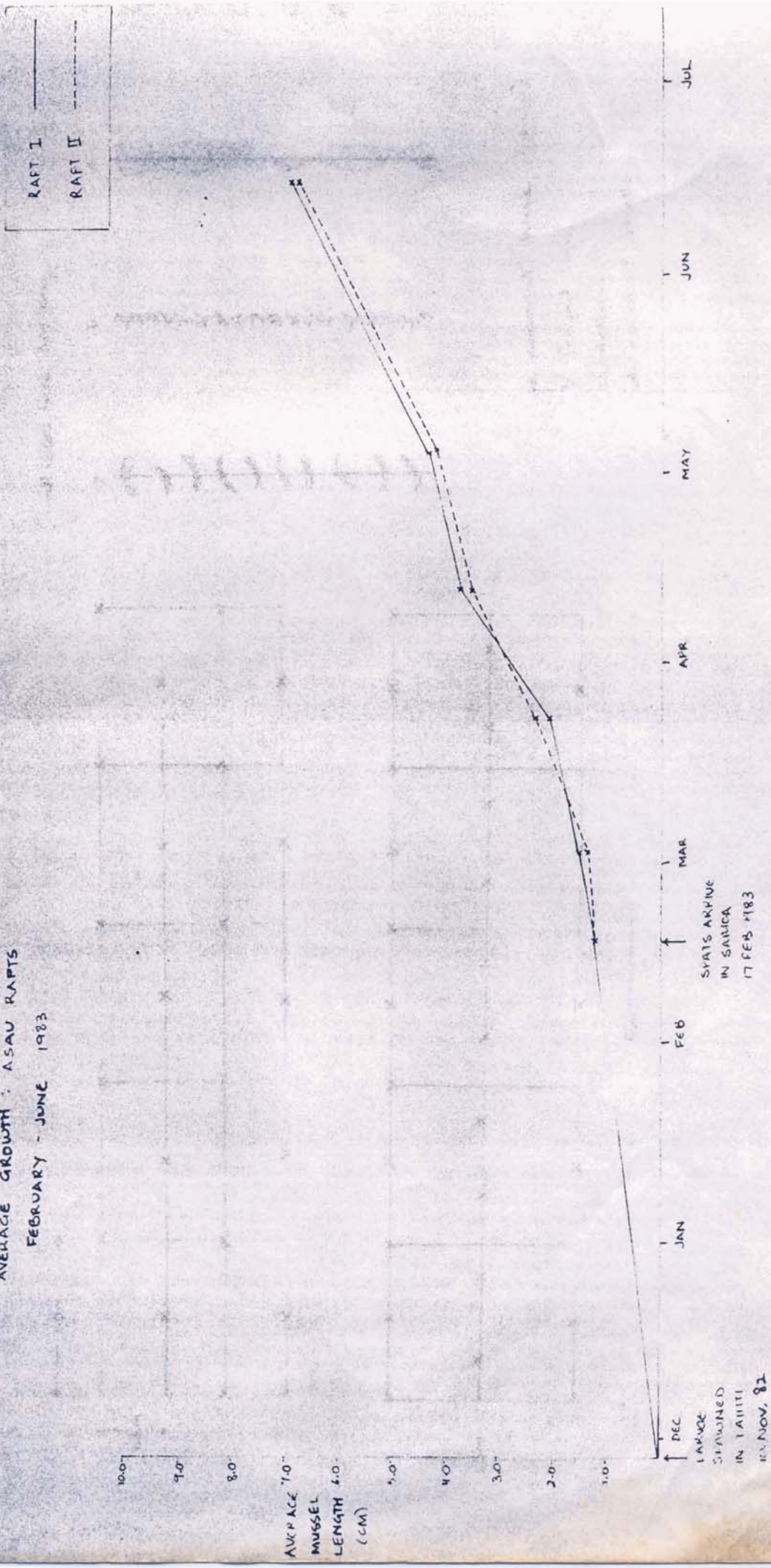
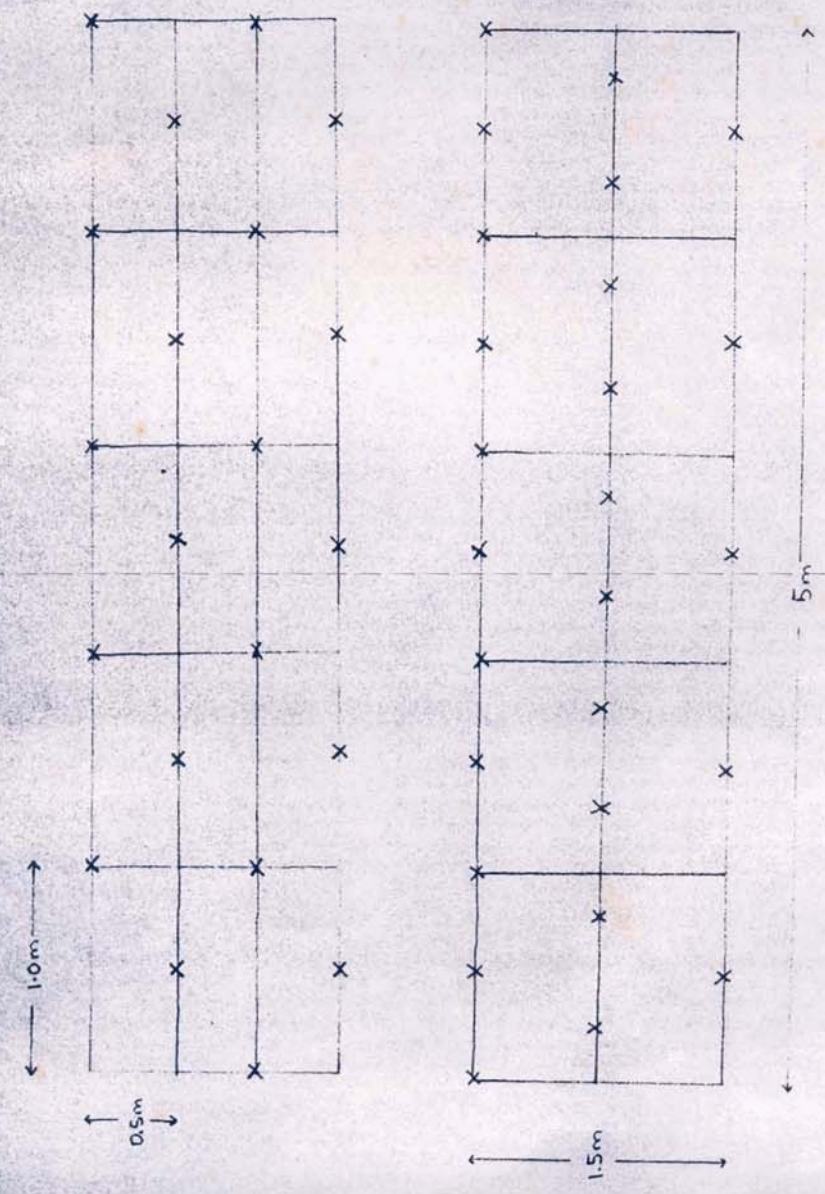
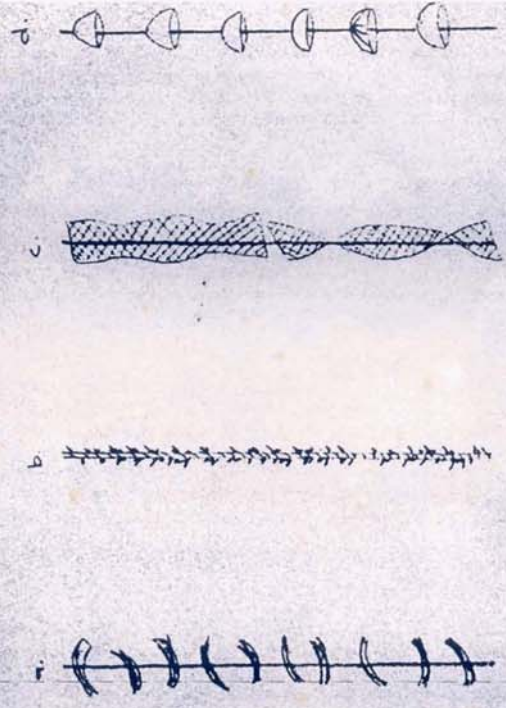


FIGURE 4.
Collector Raft Design for Aseou (July 83)



all ropes were 3m long



- a. coconut husk (pulu)
- b. frayed rope
- c. netting
- d. coconut shells