



Secretariat of the Pacific Community

**FIELD REPORT No. 24**  
on  
**TECHNICAL ASSISTANCE PROVIDED  
TO FOUR RURAL FISHING CENTRES  
UNDER THE RURAL FISHING  
ENTERPRISE PROJECT (RFEP III),  
SOLOMON ISLANDS**

17 July to 28 October, 2003

by

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This field report forms part of a series compiled by the Fisheries Development Section of the Secretariat of the Pacific Community's Coastal Fisheries Programme. These reports have been produced as a record of individual project activities and country assignments, from materials held within the Section, with the aim of making this valuable information readily accessible. Each report in this series has been compiled within the Fisheries Development Section to a technical standard acceptable for release into the public arena.

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## SUMMARY

An official request for technical assistance was received from the Government of the Solomon Islands in November 2002, with the assistance to be provided in mid-2003. Following the official request, a Memorandum of Agreement (MoA) was drafted for this project. The terms of the MoA were agreed to and signed on 15 April 2003. The objectives of the project as set out in the MoA were to conduct workshops at several Rural Fisheries Centres (RFCs) to: construct and use deep-water snapper fishing gears and techniques; construct mid-water fishing gears and techniques used in association with fish aggregating devices (FADs); train village fishermen in small boat operations and safety at sea procedures; and provide training in proper on-board handling, processing and preservation of deep-water snappers and tunas, with a focus on exporting these species.

SPC dispatched Fisheries Development Officer, William Sokimi, to the Solomon Islands on 17 July 2003 to undertake this technical assistance project. The project was initially to work with the fishermen from three centres and take three months. However, after the project had commenced, it was realised that a fourth centre would greatly benefit from the training, so the project was extended by several weeks to allow this to happen. The Project concluded on 28 October 2003 with the departure of the Fisheries Development Officer from the Solomon Islands.

The four project locations were Seghe, Afio, Semeghe and Yandina. Deep-water snapper fishing using the FAO design Samoan handreel was the main method used. The construction of a vertical longline and its use was also demonstrated in each location, as there were no FADs to fish around. Night fishing techniques using light attraction were also introduced.

The Fisheries Development Officer spent an accumulated 76 days amongst the four fisheries centres and trained 82 fishermen plus 8 fisheries centre shore personnel. This resulted in 65 fishing trips bringing in a total catch of 2857.05 kg and a gross income of SID \$15,235.73. In addition to this, bait (skipjack tuna, Indian mackerel and squid) was caught and use for the deep-water snapper fishing activities.

During the project adverse weather conditions hindered the deep-water fishing operations and the off-season fishing period made conditions harder than it should have been. Perseverance led to the fishermen resorting at times to night fishing with lights to target pelagic species. This turned out to be a salvation for the fishermen who engaged in the activity and put in place an optional fishing method in which the fishermen could do in times of bad weather on the deep bottom fishing grounds. Eventually fishing trips at the fisheries centres had started to pick up by the time the Fisheries Development Officer departed the Solomon Islands.

Most fishermen were not making the loan repayments that they were supposed to under their loan agreement. In some cases, this was a result of the off-season effect, while others were catching the fish and spending their income on other things as they were not committed to the loan repayments. It is hoped that with the new fishing season commencing in November 2003, the fish catches will increase and the fishermen will be given a chance to accomplish profitable fishing operations to get their business back in line.

## RÉSUMÉ

En novembre 2002, une demande officielle a été présentée de la part des Îles Salomon pour la tenue d'une mission d'assistance technique vers la mi-2003. Pour y donner suite, on a conclu un protocole d'accord, qui a été approuvé et signé le 15 avril 2003. Selon les dispositions de cet accord, le projet visait à organiser des ateliers dans plusieurs centres de pêche ruraux et poursuivait les objectifs suivants : mettre au point des techniques et des engins pour la pêche du vivaneau, et les utiliser ; mettre au point des techniques et des engins pour la pêche pélagique à proximité des dispositifs de concentration de poisson ; former les pêcheurs des villages à l'utilisation de petits bateaux et au respect des consignes de sécurité en mer ; offrir une formation à la manutention, au traitement et à la conservation à bord des prises de vivaneau et de thon, en mettant l'accent sur l'exportation de ces poissons.

Le 17 juillet 2003, William Sokimi, Chargé du développement de la pêche à la CPS, s'est rendu aux Îles Salomon pour entreprendre ce projet d'assistance technique. Dans le cadre du projet, qui devait au départ durer trois mois, William était appelé à travailler auprès de pêcheurs de trois centres. Toutefois, une fois le projet commencé, il s'est rendu compte qu'un quatrième centre pourrait grandement profiter de la formation et le projet a été prolongé de plusieurs semaines. Le projet s'est terminé le 28 octobre 2003 avec le départ du Chargé du développement de la pêche des Îles Salomon.

Le projet a eu lieu en quatre endroits : Seghe, Afio, Semeghe et Yandina. La pêche du vivaneau à l'aide d'un moulinet de type FAO était la principale technique utilisée. Dans chaque site, on a fait la démonstration de la fabrication et de l'utilisation d'une palangre verticale puisqu'il n'y avait aucun DCP à proximité. On a également présenté des techniques de pêche nocturne par attraction lumineuse.

Le Chargé du développement de la pêche a passé 76 jours aux quatre centres de pêche et a formé 82 pêcheurs ainsi que 8 membres du personnel à terre. Au total, 65 sorties de pêche ont été effectuées et des prises de 2 857,05 kg ont été réalisées, ce qui s'est traduit par un revenu brut de 15 243,73 dollars salomonais. De plus, de l'appât a été capturé (listao, maquereau des Indes, calamar) et a servi aux activités de pêche du vivaneau.

Au cours du projet, le mauvais temps a nui aux opérations de pêche en eau profonde, d'autant plus que l'on était en basse saison. Les pêcheurs ont parfois eu recours à la pêche nocturne avec des sources lumineuses pour cibler les espèces pélagiques. Ce fut une véritable planche de salut pour les pêcheurs, qui ont utilisé cette technique lorsque l'accès aux lieux de pêche en eau profonde leur était interdit par le mauvais temps. Le nombre de sorties effectuées à partir des centres de pêche avait commencé à augmenter lors du départ du Chargé du développement de la pêche des Îles Salomon.

La plupart des pêcheurs ne procédaient pas aux remboursements auxquels ils s'étaient engagés conformément à leur contrat d'emprunt. Dans certains cas, cela tenait à l'incidence de la pêche hors saison, dans d'autres, les pêcheurs dépensaient les revenus qu'ils tiraient de la pêche d'autres façons et n'étaient pas résolus à rembourser leur prêt. Il est à espérer qu'avec le début de la nouvelle saison de pêche en novembre 2003, les prises augmenteront et les pêcheurs auront l'occasion d'effectuer des sorties de pêche profitables pour remettre leur entreprise sur la bonne voie.

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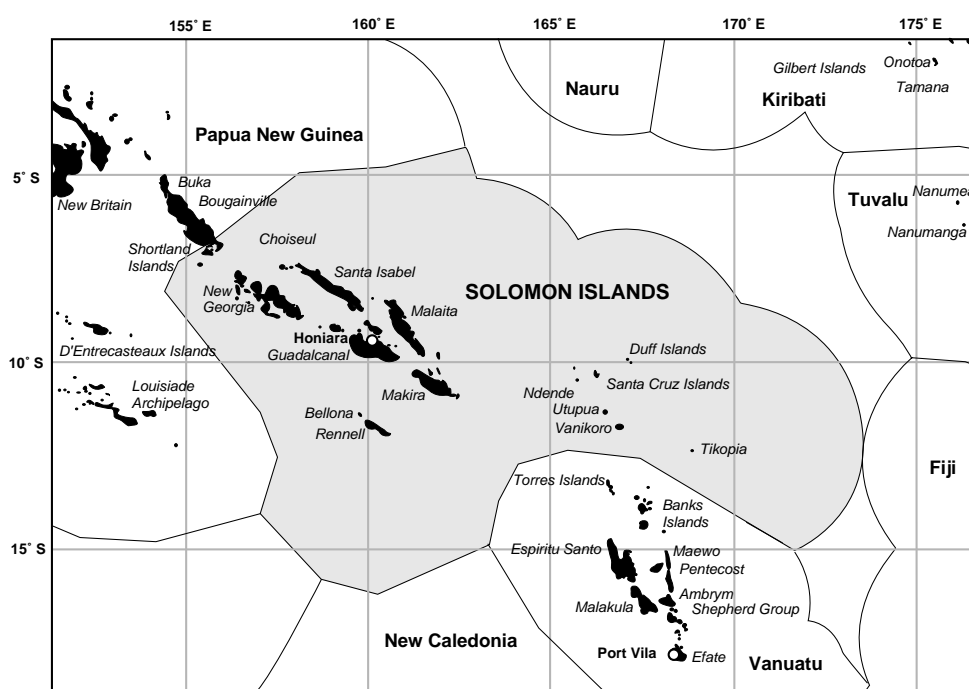
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## 1. INTRODUCTION AND BACKGROUND

### 1.1 General

The Solomon Islands (Figure 1) is the third largest archipelago in the Pacific with a total land area of around 28,370 km<sup>2</sup> and a 200 nm exclusive economic zone (EEZ) that encompasses 1,340,000 km<sup>2</sup> of sea area. The group of islands is situated in the southwest Pacific region between latitudes 05° and 13°S and longitudes 155° and 171°E. The main group is made up of volcanic mountainous islands that lay in two sub groups that run almost parallel in a northwest to southeast direction with low-lying coral atolls scattered throughout the group. The group of islands stretches approximately 1400 km from the Shortland Islands in the northwest, through the Western and Central Provinces, to Tikopia Island in the Temotu group (Anon. 1989). The main group of islands are the Rennell and Bellona Islands to the south, Ontong Java to the north and the Santa Cruz Islands to the east. The islands are grouped into nine governmental provinces. These are Western Province, Choiseul Province, Central Province, Guadalcanal Province, Isabel Province, Rennell/Bellona Province, Malaita Province, Makira/Ulawa Province and the Temotu Province (Anon. 1989).



*Figure 1: The Solomon Islands, its EEZ and neighbouring countries*

Most of the islands in the country are either surrounded by coral reefs enclosing lagoons, or have outlying coral reefs along some parts of the coast. The volcanic islands are covered with inland tropical rainforests with profuse scrubs and coconut trees along some of the coastal and swampy mangrove areas (Anon. 1989). The mid-year 2002 population estimate for the Solomon Islands was 439,400 people (SPC 2003).

The Solomon Islands have a tropical climate with an annual rainfall that averages 3500 mm. The daily rainfall levels differ regionally. Occasionally the maximum coastal temperature can be as high as 33°C but the normal daylight coastal temperatures range from 21° to 32°C, and vary throughout the year. Cool land breezes from the mountains and hills sometimes reduce the night temperatures to 19°C (Honan and Harcombe 1997). In the mornings humidity is highest and can be as much as 90 per cent. This drops off towards the afternoon. The dry season (winter months) is from late May to early December when the south-easterly trade wind is predominant. Although light rainfall is experienced and the weather is generally calm during these months, strong winds up to 50 km/hour (27 knots) and heavy rainfall occasionally occur and can last up to 10 days at a time. The summer months are from mid December to mid May. These months, especially January onwards, are generally the wet season



and higher temperatures, humidity, rainfall, and monsoon-type winds from the west and northwest are experienced. Cyclones may occur between the months of November and May (Honan and Harcombe 1997).

## **1.2 Solomon Islands' economy**

Agriculture, fishing and forestry are the major industrial activities supporting the economic development of the Solomon Islands. While small-scale manufacturing industries are trying to get a foothold, most of the manufactured commodities, including petroleum products, are imported. The development of secondary industries has met up with a lot of stumbling blocks over the years, the most recent being the Asian financial crisis of 1997 and the ethnic tension that erupted in 2000. Previous government development policies were not conducive to domestic industrial development, which probably deterred investors from fully committing to long-term infrastructures (Russell and Buga 2001).

Prior to the Asian financial crisis of 1997 and social unrest that instigated the coup of 2000, the Solomon Islands economic growth rates averaged five per cent from 1990 to 1997. Despite governments attempts in the year 2000 to rejuvenate the Solomon Islands' economic situation by implementing policies that would attract more private sector investments, the coup of 5 June in the same year and the subsequent unrest derailed the reform strategies pushing the country into an economic crisis that recorded the highest deficit (SID \$101 million) in Solomon Islands' economic history. Trade imbalances resulting from the insecurities brought about by the social unrest contributed largely to the occurrence of the high deficit figures. Exports fell to SID \$352 million, a drop of 51 per cent, while imports dropped by only 11 per cent to SID \$460.9 million. The inflation rates at the end of December 2001 was not available due to loss of data during the tensions, but the inflation rate at May 2000 stood at 6.1 per cent (Russell and Buga 2001).

## **1.3 Fisheries Development in the Solomon Islands**

The Solomon Islands Government established a Fisheries Division within the Ministry of Natural Resources in 1973. The Fisheries Division was given the task of developing and managing the fisheries resources in commercially viable operations that would benefit the nation and monitor and sustain development at provincial level. Since its investiture, the Fisheries Division has engaged in several projects focussed on sustainable social and economic revenue for the Solomon Islands. Fisheries activities were directed at maintaining adequate subsistence provision for domestic needs. Domestic small-scale trade was also carried out with other marine products such as beche de mer, trochus, turtles, etc.

Over the years, an assortment of projects were implemented in the Solomon Islands focussed on training fisheries officers and provincial Solomon Islanders in developing potential aspects of the fisheries resources such as baitfish development, tuna resources, deep-water export snappers, giant clam mariculture, seaweed mariculture, trochus, beche de mer and turtle products. Overseas funding bodies and regional organisations have played a major role in this development. These are organisations such as the Japan International Cooperation Agency (JICA), Overseas Fisheries Cooperation Foundation (OFCF), United Nations Development Programme (UNDP), International Centre for Ocean Development (ICOD), Asian Development Bank (ADB), the WorldFish Center (International Centre for Living Aquatic Resources (ICLARM) at the time), Forum Fisheries Agency (FFA) and the Secretariat of the Pacific Community (SPC).

Fisheries development in the Solomon Islands has occurred on two main fronts. With rich tuna resources passing through its EEZ, both small-scale and industrial-scale tuna fishing activities have been pursued, while at a rural level, coastal fishing centres have been establish to target the deep-water snapper and inshore pelagic resources. The resources of the lagoons and reefs have been left for subsistence and artisanal fishing activities, apart from the live baiting that is undertaken by the pole-and-line vessels for tuna fishing. For this the tuna companies pay a royalty to the village people for access to the baitfishing grounds.

### 1.3.1 *Tuna fishery*

The foundation for large-scale commercial development of the tuna fishery in the Solomon Islands began in 1971, with the positive conclusion of a tuna and baitfish survey that was instigated by the Joint Venture Agreement 1 (JVA 1), an alliance between the Taiyo Fishing Company of Japan and the Solomon Islands Government to form Solomon Taiyo Limited (STL) in 1972. Foreign revenue was gained from the tuna pole-and-line industry that supplied tuna to the canning factories at Noro and Tulaghi from which tuna products were exported to overseas markets such as the United Kingdom, Japan, Australia, Fiji, and American Samoa (Anon 1989).

In 1977, the National Fisheries Development Ltd (NFD) was formed by the Solomon Islands Government and STL. The NFD had its own fleet of pole-and-line vessels to catch tuna for the canning factory at Tulaghi, which was the purpose of establishing the company. Licensing of the tuna distant water fleet to do purse seine fishing and tuna longline fishing in the Solomon Islands EEZ also brought in substantial foreign revenue (Anon. 1989).

During the 1980s and 1990s, STL and NFD were the two main tuna fishing companies in the Solomon Islands. In 1980, STL bought in group purse-seiners with 960 t of fish landed by this operation in its first year. The number of pole-and-line vessels was also increased during the 1980s, up to 35 in some years (FFA 1995). NFD introduced two purse-seiners to the fishery in 1988, which added another 4,000 t to the 1988 and 1989 annual tuna catch. Also in 1988, NFD started to sell its catch to other processors and moved away from supplying STL. In 1990, the ownership of NFD also changed hands. Catches in the surface tuna fishery by these two companies fluctuated during the 1990s from 30,000 to 55,000 t (Lawson 2002).

In 1994, Solomon Islands Imports and Exports Limited entered into an agreement with C & L Exports in Australia to establish a longline fishing company to catch and export fresh tuna. This operation folded within a year. A different tuna longline joint venture was established in 1995 between a local company and the Sanwa Trading Co. of Japan. The company was called Solgreen and they operated 10 tuna longliners exporting fresh tuna to Japan (Gillett in press).

Small-scale tuna fishery development in the Solomon Islands has been limited. STL and NFD both maintained fish aggregating device (FAD) programmes for their tuna fishing operations. Some local fishermen in their outboard-powered skiffs would go and troll around these for tuna. Alternately, small-scale fishermen would troll surface schools of tuna off the reef from their village in season. This fishery has not expanded much due to the low value of the fish and the cost of getting it from rural centres to market in Honiara. The exception to this is a small village on the outskirts of Honiara where there is a strong market for fresh small tunas.

In 1998/1999 the Fisheries Division with assistance from FFA and SPC drafted a National Tuna Fishery Management and Development Plan for the country (Anon. 1999). The plan was developed with industry consultation and provided some stability to the tuna fishery and the policies governing the fishery. The plan and the supporting reports to the plan also looked at areas where domestic development could occur in the tuna fishery, including small-scale operations and medium-scale tuna longlining (Chapman 1998).

Unfortunately, most of the good work that was done in the earlier years, since 2000 has come undone as a result of the ethnic tension and the coup of 2000. Infrastructure has been torn down and a lot of fisheries assets stolen or destroyed. Important documents and records were also destroyed and administrative operating systems collapsed. Most of the fisheries institutions went back to basic management practises. The Fisheries Division is now in the throes of trying to put their house back in order to catch up with the development of fisheries from where they left off — a daunting task but one that has to be accomplished.

### *1.3.2 The Rural Fisheries Enterprise Project (RFEP)*

During the 1980s and 1990s there were 32 Rural Fishing Centres established around the Solomon Islands by a range of donors. Most of these centres closed as soon as the donor funding ceased, and many of the donors have not been back. This section looks at one of the more long-standing donors who are now in the third phase of operation in several centres around the Solomon Islands.

The Rural Fisheries Enterprise Project (RFEP) is an aid project funded by the European Union (EU) with the objectives of developing small-scale commercial fishing activities in rural areas through training, technological transfer of management and marketing expertise, and the establishment of infrastructure and equipment. The fishing activities are concentrated around Rural Fishing Centres (RFCs) that are intended to operate on a financially sustainable platform. The RFEP III operates within the Provincial Development and Extension Services section of the Department of Fisheries and Marine Resources.

The project has been through two phases (I & II) and is now in Phase III. During Phase I, which operated from 1990 to 1994, three decommissioned Japanese-built rural fishing centres (Tatamba, Yandina and Marau) were reformed and made operational again under the management of RFEP1 staff. Privately owned vessels and 17 outboard powered boats were distributed among the three centres for fishing operations. Local management teams gradually replaced the RFEP1 staff once the project objectives were achieved and the RFEP1 participation was retracted.

Phase II ran from 1994 to 1998 and was based on the same objectives as Phase I, with the restoration of 3 more fishing centres (Seghe, Afio, and Bahana) and the construction of one new fishing centre (Semeghe). Concurrent to its operations, RFEP2 staff continued to contribute support to the centres established under Phase I. At the conclusion of Phase II it was anticipated that the operations of the RFCs would not be sustainable with the current set up and would need further input to strengthen the operations towards financial viability (Preston et al 1998). Phase III of the RFEP project was commenced in 1999 to pursue much the same objectives as Phases I and II but, based on past experiences, to institute workable mechanisms to ensure that the RFC's would undoubtedly attain sustainable financial viability.

The RFEP III objectives were specifically focussed on establishing improved access to markets; diversification of RFC activities, and to maintain adequate and sustainable fish supplies to the fish centres. The ultimate objective of the RFEP III was to establish workable management strategies for the fisheries centres that would eventually lead to autonomous management by commercial enterprises accountable to the provincial administrations of the areas in which the centres were located. Local fisherman's associations will have a participative role in the general operation of the centres. The five main activities pursued were to:

- improve management of the RFCs,
- establish regular transportation from the RFCs to Honiara and onto local and overseas markets;
- create a loan fund to enable enterprising locals to purchase boats and fishing related equipment;
- establish a marketing unit to facilitate viable marketing of the fish products; and
- establish improved resource management and fishing technology.

The fishing centres covered under RFEP III are Afio (West Maramasike) in Malaita Province; Bahana (Kia) and Tatamba in Isabel Province; Seghe (SE New Georgia Island) in Western Province; and Semeghe (Florida Is) and Yandina (Russell Islands) in Central Province. The RFEP III is approaching the final stages of its programme in the Solomon Islands. It was initially intended that the project would conclude by December 2003 but the time was extended to March 2004 so that all outstanding work would be completed in order to properly complete facets of the project before the handover.

The development of rural fisheries centres into viable economic operations is dependant on the fish and marine products that are supplied to the centres, which in turn is dependant on the fishermen who supply the products. It was acknowledged that small-scale canoe supplies would not produce the desired impact to make a fisheries centre commercially viable, hence the need to make available upgraded equipment to rural fishermen. The endeavours of the majority of canoe fishermen to purchase modern equipment of their own was rarely realised as the fishermen would have to do long term savings from meagre earnings or attempt to obtain a loan from the commercial banks — something that is next to impossible for a person with no steady income or collateral to guarantee loan repayments. The RFEP fisherman's loan scheme was implemented to encourage local fishermen to take up fishing, by making available uncomplicated means to attain their own boats and fishing equipment provided they put genuine effort into helping themselves. The RFEP has a loan fund of SID \$1,750,000 (Russell 2002) available for distribution to appropriately selected applicants. The fund operates as a revolving fund that is made available to new applicants through money obtained from repayments made by the initial loan recipients.

To obtain loans under the scheme, the applicants have to agree to several criteria that benefit the development of the fisheries centres as well as the fishermen and the province. These criteria also put in place a system to monitor the fishermen's performance and is an indicator that determines whether the boats and equipment are being used for the purposes for which they were obtained — fishing.

The loan applicants are required to (Russell 2002):

- Pay application fees when the application forms are submitted;
- Be a member of the Fishermen's Association that is affiliated with the fisheries centre in their province. An applicant will still be eligible for a loan consideration if a Fishermen's Association has not yet been established in his area;
- Consider the loan as a fully commercial exchange although the successful applicant will not be required to provide security for the loan;
- Agree to an annual interest rate of 12.5 per cent on the declining balance;
- Agree that amounts under SID \$5000 are subjected to a non-refundable application fee of SID \$50;
- Agree that amounts between SID \$5000 and SID \$12,000 are subjected to a non-refundable application fee of SID \$75;
- Understand that since large loans are more risky, the applicant will need to show that he is able to repay the loan. Therefore, applications for loans over SID \$12,000 should be forwarded to the RFEP HQ, with the understanding that they will most likely be required to get assistance in writing their loan application through consultants working for the South Pacific Project Facility (SPPF). The organisation is part of the International Finance Corporation based in Sydney. Applications forwarded to the SPPF are exempt from the one percent application charge but are subject to a SID \$100 charge. Successful applicants will be charged a success fee of SID \$1000, which will be added to the loan;
- Agree that amounts between SID \$12,000 and a maximum of SID \$50,000 are subjected to a non-refundable application fee of one percent of the loan requested if their application is not sent to the SPPF. Applicants will initially be required to pay a fee of SID \$100 while awaiting the RFEPs decision on whether the loan should be forwarded to the SPPF;
- Accept successful loans in the form of the requested equipment only and no cash will be exchanged;
- Agree to accept equipment that is only listed on the RFEP HQ approved supplier's list;
- Sell all catches to the fisheries centre until their loans are paid off; and
- Deduct loan repayments from the catch landed.

## 1.4 Initiation of the project and objectives

In support of the Rural Fishing Centres (RFCs), and to provide additional assistance to them through training in the different small-scale fishing techniques, the RFEP sought technical assistance from the SPC's Fisheries Development Section through the Government of the Solomon Islands. An official request for technical assistance was forwarded to the SPC in November 2002, with the request for assistance to be provided in mid-2003, when more loans would have been approved and more fishermen equipped to go fishing under the loan scheme.

Following the request for technical assistance, a Memorandum of Agreement (MoA) was drafted for this project. The MoA clearly set out the roles and responsibilities of both SPC and the Solomon Islands Government through the Fisheries Division and the RFEP. The terms of the MoA were agreed to and signed on 15 April 2003. The objectives of the project as set out in the MoA were to conduct workshops at several Rural Fisheries Centres (RFCs) emphasising the following topics:

- Construction and use of deep-water snapper fishing gears and techniques;
- Mid-water fishing gears and techniques used in association with FADs;
- Small boat operations and safety at sea procedures; and
- Proper on-board handling, processing and preservation of deep-water snappers and tunas, with a focus on exporting these species.

SPC dispatched Fisheries Development Officer, William Sokimi, to the Solomon Islands on 17 July 2003 to undertake this technical assistance project. The project was initially to work with the fishermen from three centres and take three months. However, after the project had commenced, it was realised that a fourth centre would greatly benefit from the training, so the project was extended by several weeks to allow this to happen. The Project concluded on 28 October 2003 with the departure of the Fisheries Development Officer from the Solomon Islands.

## 2. BOATS, GEAR AND FISHING METHODS USED DURING THE PROJECT

During the workshops and practical sessions at the four RFEP centres, a range of fishing methods were covered. These included deep-water snapper fishing and mid-water fishing gears and techniques. A standard vessel was also used in each location, as these were the boats that came as part of the loan scheme.

### 2.1 Vessels issued as part of the loan package

The vessels issued to the RFC fishermen under the loans scheme were 21 foot (6.4 m) round cabin 10 mm fibreglassed boats (Figure 2) manufactured by Auaua Industries of Honiara. The RFC fishermen preferred these vessels to others because they were lighter and had sufficient stability for fishing. The durability of these vessels, however, needs to be assessed over a period of time. Previously under the



RFEP I and II stages, bigger vessels were used but the fishermen did not favour these vessels because they were heavy and needed bigger engines to power them, which resulted in more expenses for the fishermen in terms of fuel consumption. The first lot of vessels under the RFEP I were constructed of plywood and powered by 15 HP engines that was too underpowered for them. These vessels have all aged and were scrapped. During RFEP II and the early stages of RFEP III, 23 foot (7 m) round cabin fibreglassed vessels were constructed and issued to the fishermen. The design of these vessels was the predecessor to the current 21 foot (6.4 m) version.

*Figure 2: Fiberglass round cabin vessel issued under the RFEP III*



The RFEP III fishermen powered their boats with 15, 25, 30 and 40 HP outboard engines. While the fishermen of Seghe, Afio and Semeghe preferred Yamaha Enduro engines, the fishermen of Yandina had a mixture of Yamaha Enduro engines and Suzuki engines. At Semeghe the fishermen preferred the bigger engines so that they could make the crossing to Honiara to sell their fish, acquire fuel supplies and replenish their fishing gear. Some fishermen preferred the bigger engines because their fishing grounds were further away and a bigger engine would quickly get them there and back.

## 2.2 Deep bottom fishing gear and method

One of the main fishing techniques used during this project was handreel fishing for deep-water snappers. The species are generally fished in depths of 150 to 350 m; more information can be found in the SPC publication, *Deep bottom fishing techniques for the Pacific Islands* (Preston et al 1999).

### 2.2.1 Handreel fishing

The FAO design Samoan handreel (Figure 3) used by the RFC fishermen were the same as those used throughout the region by small-scale fishermen targeting deep-water snappers. Most of the project time was spent training the fishermen to perfect their deep bottom fishing operations. The RFC fishermen were all proficient in the deep bottom fishing method so attention was focussed on teaching the fishermen how to rig gears to suit 'quick turn around' fishing techniques. To do this, fishing accessories were required. When using basic gear, all that is required is the monofilament lines and the appropriate hooks. However the advanced gear required corkscrew swivels, crimps to suit the monofilament line sizes, three-way swivels, coast-lock snaps, and hooks appropriate for the size and type of fish to be caught.

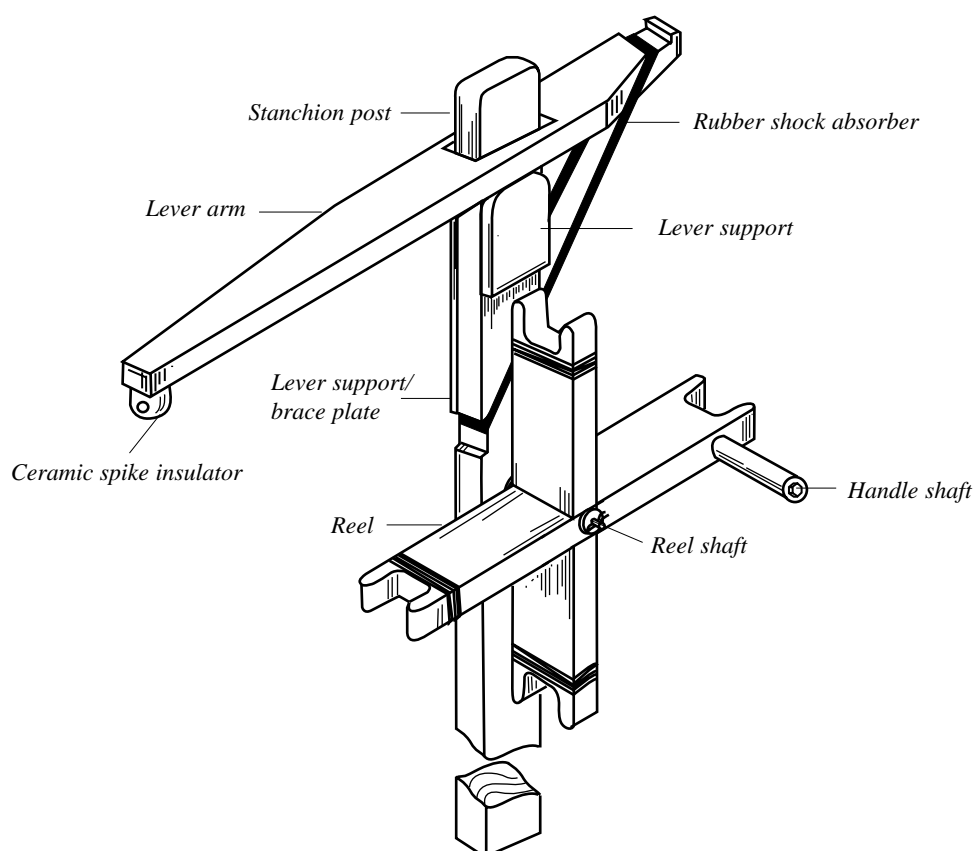
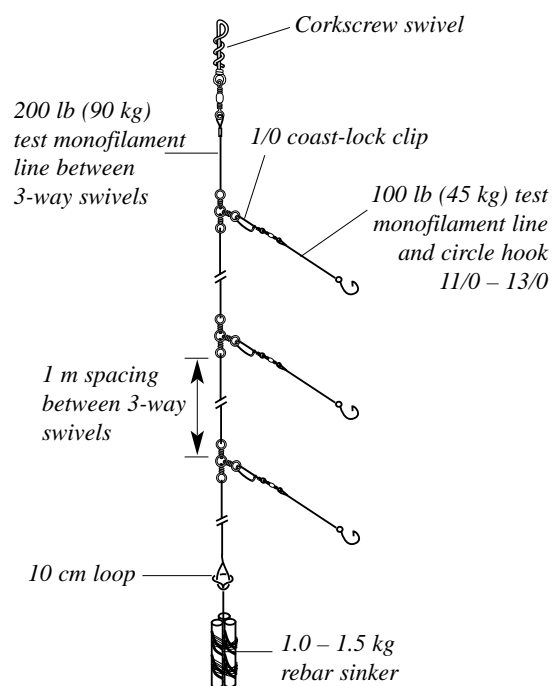


Figure 3: FAO design Samoan handreel

The standard practice of the deep bottom fishing method is that when fish are hauled up, the fisherman has to unhook the fish, re-bait the hook then deploy the line once again. This operation is normal for all hook-fishing methods. The delay to the operations comes when a shark is caught and caution is required to remove the hook from the mouth; or when the hook snubs firmly in a fishes mouth and the fisherman has to spend time trying to work it out; or when two lines tangle at the trunk line section and need to be unravelled. Permanently fixed snoods to a terminal rig become a hindrance at this point. However, removable snoods on a terminal rig (Figure 4) are very handy in these situations. All that needs to be done is to unsnap the snoods from the trunk line, snap new ones on and the line is ready to be deployed again. The disabled snoods can then be freed from its predicament and re-baited or repaired for future use.

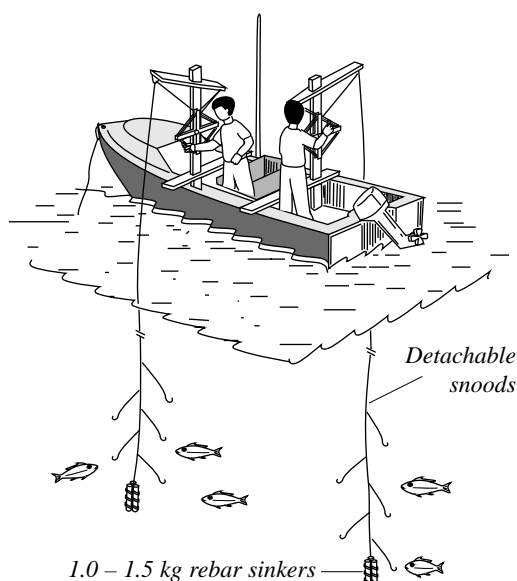


**Figure 4: Deep bottom terminal rig with detachable snoods**

A set of the deep bottom gear components used during the project consisted of 500 m of 250 lb (115 kg) test monofilament mainline wound onto each wooden handreel; 4 m of 200 lb (90 kg) test trunk line interconnected every metre by a three-way swivel (three swivels in all — Figure 4); a corkscrew swivel crimped to the top of the trunk line and a 10 cm loop at the bottom; 1.0 to 1.5 kg rebar sinker; and 20 cm x 100 lb (45 kg) snoods connected to each of the three-way swivels. The snoods had a hook crimped at one end and a swivel with coast-lock clip at the other. The circle hooks used during the project varied in sizes from 11/0 to 13/0.

During the fishing trips, three to four persons were assigned to a vessel. A standard procedure was followed during the project. When a fish was caught it was brought onboard, the snood unclipped from the three-way swivel on the trunk line, and a new baited snood clipped onto the three-way swivel before it was lowered back into the water again. This arrangement worked very well. One person dealt with unhooking, spiking and icing the fish then re-baiting the used snoods in readiness for later use.

Two men can crew a vessel this size equally well if an operator wishes to cut back on costs (Figure 5). Re-baiting snoods and icing fish can be done while the sinker is still finding its way to the bottom. However, on active trips the third person can relieve anyone on the reel who gets tired from the constant winding up chore. When three reels were tried out it was found that the close proximities of the lines resulted in regular line tangles, especially when a current was running. The third reel was kept as a standby and used when the current had died down.

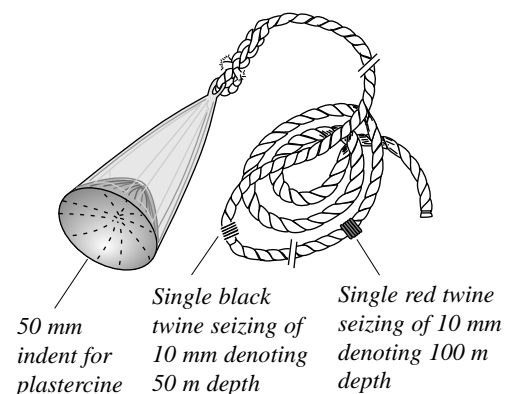


**Figure 5: Using the FAO design Samoan handreels**

### 2.2.2 Assessing and sounding new deep bottom fishing grounds

It was observed that most of the four RFC's fishermen habitually returned to the same fishing spots and very few of them ventured to new grounds. When an adventurous fisherman tried a new ground and was successful, that ground was added to the list of potential fishing grounds, once the secret got out. Part of the reason for this was the fishermen's lack of knowledge of the seabed and the depths at different areas. Another reason was that most of the fishing grounds were far from the fisheries centres and the fishermen did not want to take the risk of trying out a new ground only to find that the area had no fish, was too shallow or had a steep 'drop-off'.

The fishermen were taught to read charts, use a GPS and to construct and use sounding leadlines as an alternative to using an echo sounder. Given time, the enthusiastic fisherman will be able to own an echo sounder; but seeing as the cost of the sounder is currently beyond the means of most rural fisherman they were taught to use the basics. A sounding leadline (Figure 6) is a line or rope with a plummet or mass of lead attached to the end, with the rope graduated at intervals so that depth readings can be taken. The full length of the leadline was 500 m with a 2.0 kg lead sinker on one end and the other end attached to its storage basket. The lead sinker was moulded into a cone shape with a hollowed out bottom or 50 mm indent filled with plastercine. The leadline was marked every 50 m with a black twine seizing of 10 mm and at the first 100 m a single 10 mm red twine seizing was attached, at 150 m two black and at 200 m two red twine seizing and so on until the four hundred metre mark of four by 10 mm red twine seizings. This piece of equipment is simple to construct and essential for determining the type of bottom in a particular fishing ground.

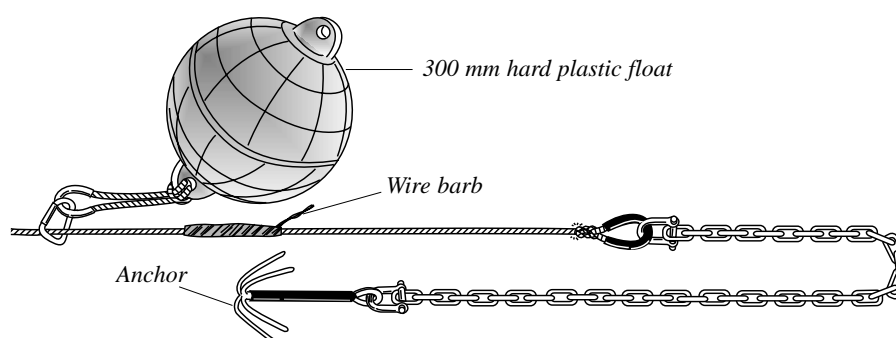


**Figure 6: Leadline used for sounding and checking the type of bottom being fished**

The RFC fishermen were trained to check the sounding by lowering the lead plummet to the seabed while taking note of the graduated mark on the rope and the interpolated length between two marks. Before the line was hauled back, the plummet was thumped several times on the sea bottom then retrieved. The plastercine on the bottom end of the plummet was then inspected to determine the type of bottom substance stuck to it. This gave a good indication of whether the bottom was dead coral, live coral or just sandy. Live fan or lace type corals are found in good deep bottom fishing areas.

### 2.2.3 Anchor gear used for deep-water snapper fishing

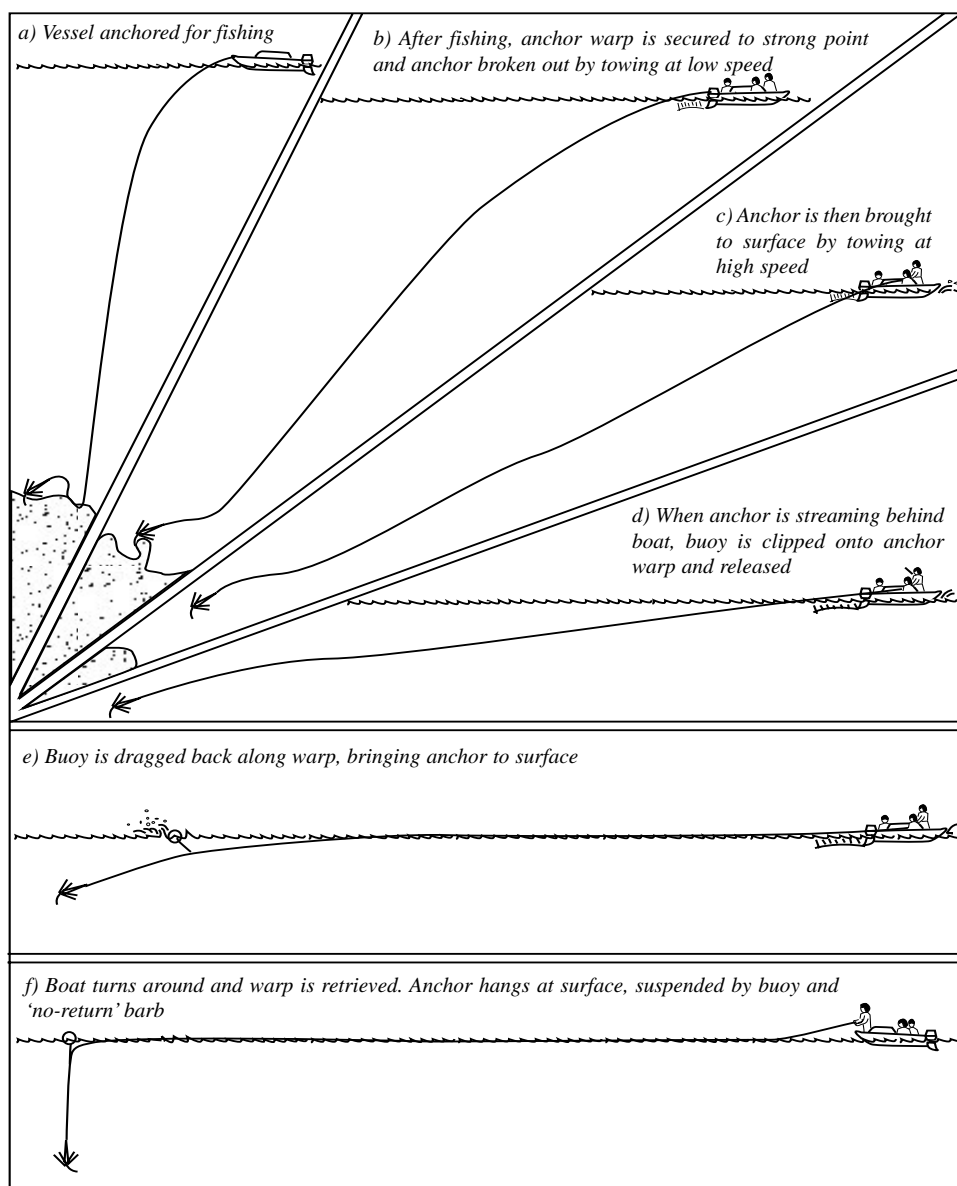
During the project, much of the deep bottom fishing was done in 150 to 350 m depths. At such depths it was difficult to hand-haul the anchor each time a fishing spot was tried. Hand hauling the anchor sometimes deters fishermen from changing fishing spots when the fish does not respond in a particular area. During the fishing trips the anchor was hauled up using the vessels engine and a 300 mm hard plastic float with a shackle connected (Figure 7).



**Figure 7: Anchor gear**



The anchor rope was tied off at the stern of the vessel. While the vessel motored forward towards the deeper slope, the float was attached to the anchor rope by way of a shackle (Figure 8). As the boat moved forward the shackled float gradually slid down the anchor rope while the anchor was towed to the surface (Figure 8). A barb was lashed onto the anchor rope approximately one metre from the connection to the anchor chain, facing towards the anchor. The barb snagged the float shackle and prevents the anchor from sliding back down again when tension was released from the line (Figure 8). This allowed the vessel to backtrack and collect the slack anchor rope floating on the surface and retrieve the anchor.



**Figure 8: Anchor retrieval method**

## 2.3 Mid-water fishing gear and techniques

Three mid-water fishing methods were demonstrated to the fishermen. These were the vertical longline, ika shibi, and palu-ahi methods. Since part of the ika-shibi method requires the use of lights, the light fishing technique was elaborated on to use this in the open sea (ika-shibi) and in shallower protected waters. The four RFC's did not have any equipment for the construction of the mid-water fishing gears, so the Fisheries Development Officer had to make improvised gears at Seghe and, at the other RFC's when his equipment arrived — a single unit of each gear for the different methods.

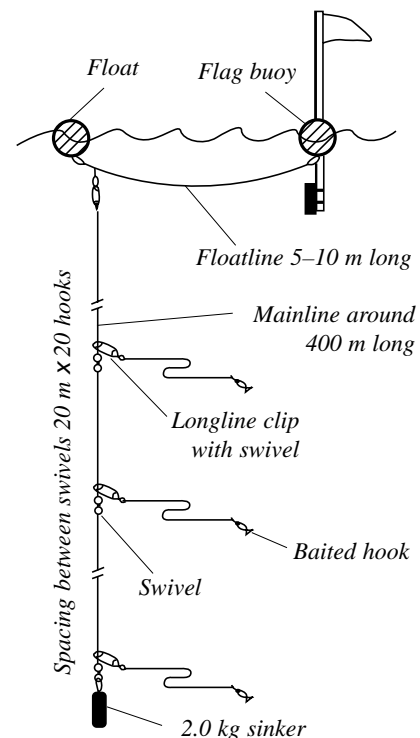
Unfortunately not much time was allocated during the project to performing the mid-water fishing methods so mainly demonstration sets were conducted. This was due to lack of gear to distribute to all the fishermen. To conduct fishing trips with only one set of gear on board specifically to carry out the mid-water fishing techniques would not be viable. Rough weather on the open seas, lack of FADs and the need for the fishermen to have more time to upgrade their deep bottom fishing operations were also pressing elements to take into account. Despite this, the idea of the mid-water fishing methods went across very well and the RFC fishermen were eager to obtain gears so that they can try out these methods on their own.

### 2.3.1 Vertical longline

There were no FADs near any of the RFCs. Therefore, the vertical longline trials were carried out in areas where tuna schools normally frequent. Vertical longlining is especially effective around FAD's though. The vertical longline fishing method was demonstrated twice in Seghe, Afio, and Yandina and once in Semeghe. These demonstrations were carried out en-route to deep bottom fishing grounds and on several occasions, off the deeper end of the destined deep bottom fishing grounds. Except for minimal results at Afio and Yandina, few fish were caught at the other two centers as the lines were left only a short time to soak. Despite this the fishermen were well aware of the potential that the vertical longline method has.

The vertical longline gear put together at each of the RFC's consisted of a bamboo pole marker, 3 m long x 30 mm diameter with a 40 x 40 cm white cloth flag attached to the top of the pole. The bottom of the pole had a 2.0 kg sinker securely attached and a 1-metre bridle connected. A snap (.135 x 8/0) was attached to the bridle for snapping onto a mainline float. The mainline was made up of 20 sections x 20 m of 2.5 mm (270 kg test) monofilament line with a 38 g barrel swivel crimped on at every section (Figure 9). The branchlines consisted of 20 x 6 m x 1.8 mm (135 kg test) monofilament lines with a 15/0 tuna circle hook crimped onto one end and a .135 snap with 8/0 swivel crimped onto the other (Figure 9). The vertical longline was weighted down with a 2.0 kg sinker and suspended from a 300 mm molded plastic longline float connected to the flag marker with 0.5 m x 6 mm polypropylene rope rove though a 3.5 x 125 mm snap. More information on FAD mid-water fishing methods can be found in the SPC publication, *Vertical longlining and other methods of fishing around fish aggregating devices* (Preston et al 1998).

**Figure 9: Vertical longline arrangement**

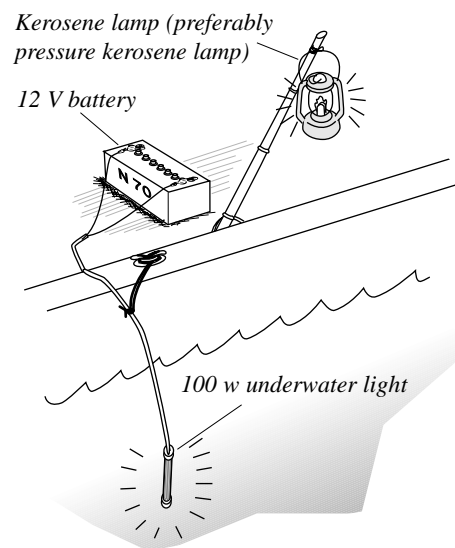


### 2.3.2 Night fishing methods for pelagic fish

Initially, the night fishing methods were demonstrated simultaneously with deep bottom fishing, but the high incidence of pelagic fish attacking the deep bottom fish before it could be boated forced the two fishing methods to be done at separate times. While the Fisheries Development Officer was in the RFC's, several fishing trips were carried out to demonstrate these methods and to prevent the fishing trips from ending in a profitless venture. When deep bottom fishing trips had to be aborted due to unfavourable weather conditions, night fishing using lights was a good alternative which enabled the fishermen to continue their fishing operations and earn an income instead of limping home defeated. The best time for these fishing methods was during the dark moon phases or during the moon phases when there were longer periods of darkness.

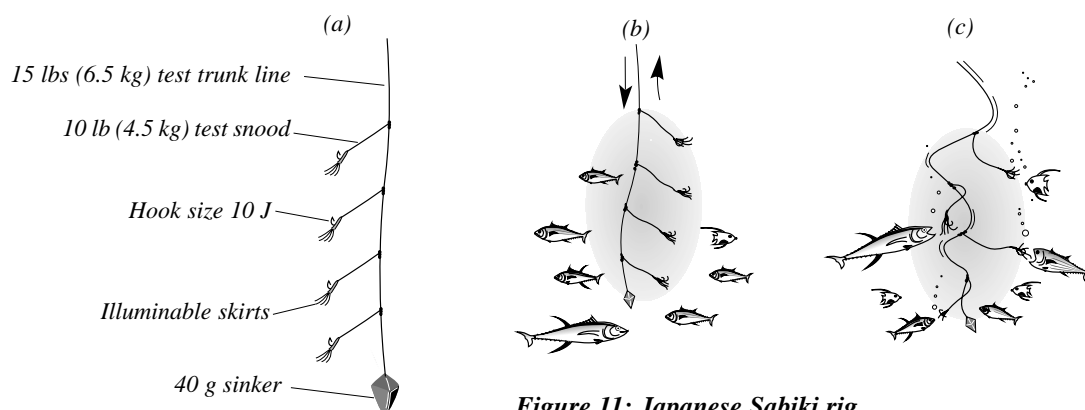
Since the weather pattern was unpredictable at this time of the year, the fishermen were encouraged to include lamps among their fishing equipment especially when they went out on overnight fishing trips

and the weather dissuaded them from fishing the deep bottom fishing grounds. While the fishermen carried torches, lamps were not carried as an essential aid to overnight fishing. They were encouraged to include a lamp as part of the essentials in their fishing kit. Normal kerosene lamps were sufficient to attract fish to the vessel but the kerosene pressure lamps provided better light and withstood the wind better. On fishing trips targeted at deep bottom species, the lamp was positioned in a safe inboard position that provided better vision for the fishermen to work by, but sheltered from drawing the pelagic species to the vessel. However, to target the pelagic species, the lamp was hung on a pole over one side of the vessel (Figure 10). An alternative to the lamp is to use an underwater light that is powered by a 12-volt car battery (Figure 10). The light is lowered over the side to a depth of 2 m and secured. Both the lamp and the underwater light can be used at the same time (Figure 10).



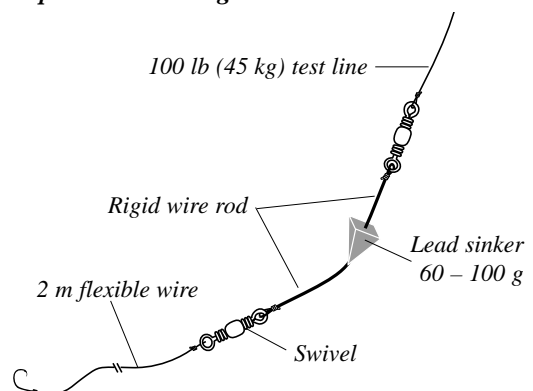
**Figure 10: Kerosene lamp on pole and an underwater light used for attracting fish at night**

Japanese Sabiki rigs (Figure 11) were used to jig for bait. The Sabiki rig consisted of a trunk line with four to six hooks attached to it on short snoods. The trunk line was made of 15 lbs (6.5 kg) test monofilament line while the snoods to the hooks were made of 10 lbs (4.5 kg) test monofilament lines. The hooks were size 10 'J' hooks with illuminable jiggling skirts attached to it. Although the Sabiki gear comes in factory-manufactured units and can be purchased from shops selling fishing gears, the fishermen were shown how to make up their own units if the factory-manufactured gear was not available. This can be made up from the same strength monofilament lines and size 10 'J' (O'Shaughnessy) hooks that had white feather bound to it with red cotton. Another method of catching the Indian mackerel was to fish it up using No.10 hooks with dough bait attached to it. The dough was made out of flour and tinned fish, mixed together with just sufficient water, to make it firm and elastic (not brittle or squishy). Tiny pellets were pinched and rounded off from the main dough and attached to the hook. The Indian mackerel were very much attracted to this bait.



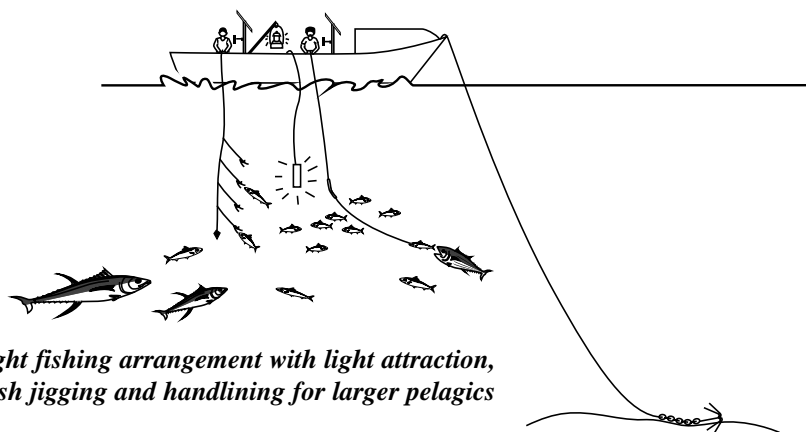
**Figure 11: Japanese Sabiki rig**

The mainline gear for the bigger pelagic species (ika-shibi-type gear) was made from a single 100 m coil of 100 lb (45 kg) test monofilament line attached to a sinker rig constructed from a curved rigid wire with a sinker on it and a swivel at both ends (Figure 12). At the lower end of the sinker rig, 2 m of 7 x 7 x 0.81 mm stainless steel trace wire with a number 11/0 circle hook was crimped on.



**Figure 12: Ika-shibi-type line used for bigger pelagics**

The method of fishing was easy. The light attraction allowed the Indian mackerel, squid and other baitfish to accumulate around the vessel and make it easier for the fishermen to jig. When bait was caught the live bait was then attached to the stronger ika-shibi-type mainline and lowered over the side to catch the bigger pelagic species circling beneath the bottom of the boat in the darker region (Figure 13). When a larger pelagic was hooked, it was hauled by hand and boated.



*Figure 13: Night fishing arrangement with light attraction, baitfish jigging and handlining for larger pelagics*

### 3. PROJECT ACTIVITIES AND RESULTS

Although the objectives of the project were the same for all the fisheries centres, the work carried out at each centre was approached differently and had varied outcomes. The fishermen at each of the centres shared similar experiences but some centres had slight variations and distinct problems to deal with.

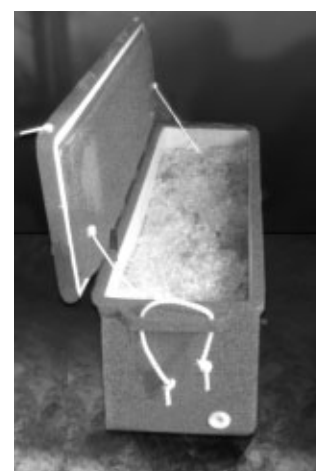
The Fisheries Development Officer spent an accumulated 76 days amongst the four fisheries centres and trained 82 fishermen plus 8 fisheries centre shore personnel. This resulted in 65 fishing trips bringing in a total catch of 2857.05 kg and a gross income of SID \$15,235.73.

#### 3.1 Preparing for a fishing trip

Two distinct checklists were prepared for the fishermen to follow before each trip was made; one was a safety checklist and the other a checklist for fishing gears and vessel readiness. Before each fishing trip the fishermen ensured that their vessels were thoroughly cleaned and bleached then loaded according to the checklists. The safety checklist ensured that the necessary safety items were carried on the vessel in case of breakdowns or accidents. The standard fishing gears checklist listed all the items required for a fishing trip and has all the common tools that are normally required by a fisherman. An extension to the fishing gears list is a specific checklist for the different types of fishing methods. If a fisherman was to make a vertical longline fishing trip then the vertical longline list was followed in addition to the standard list. If several fishing methods were to be undertaken then the checklists for the particular fishing methods were followed. A copy of the checklists is at Appendix A.

#### 3.2 Fish handling and storage on ice

One of the main functions of the RFC's operations is to educate and encourage the fishermen of the rural areas to employ hygienic and approved practises in the handling and storage of fish. The RFC's all had segregated rooms for weighing, processing and packing fish. These rooms were scrubbed down and sanitised with bleach before fish from the fishing vessels were weighed and packed for shipment to Honiara (Figure 14). The windows and doors to the processing rooms were all screened so that flies and insects could not get in. The managers of the fisheries centres were all previously trained to maintain this standard and in all four centres visited, each manager practised this attentively; which was encouraging.



*Figure 14: Fish packed in ice ready for shipment to Honiara*

The RFC fishermen were already aware of the need to maintain hygienic practises in order to produce quality fish. This was probably the result of training implemented during RFEP I and II, but despite this some of the fishermen tended to take short cuts. All the fishermen were coached on the necessity to try to maintain an honest and approved operation so that in the end they can consistently provide quality fish. While some went out of their way to stringently enforce these practises, others were negligent and were reminded of the important role that meticulousness plays in fish handling. The Fisheries Development Officer encouraged the RFC managers to develop a coaching and leadership attitude when managing the fishermen attached to the RFC's. They needed to constantly supervise the vessels before ice and bait were loaded. For the rest of the duration that the Fisheries Development Officer was attached to the RFC's, the eski's and the vessels were checked for cleanliness before any loading took place. Some of the fishermen usually arrived at the RFC jetty with almost spotless vessels while several others were coached to clean their vessels before they loaded ice. Eventually the message got across to everyone. It is hoped that the RFC managers continue to maintain diligence in this area in order to enhance the chances of quality fish being delivered to the centre.

### 3.3 Fish markets

The RFC fishermen are compelled by the conditions of the loan scheme to sell their catch to the fisheries centres at prices set by the RFEP marketing unit in Honiara. The prices were formulated in consideration of the fishermen's commitments (cost of operations etc), overseas market prices, freight costs from the fisheries centre to Honiara, freight costs to the overseas market, cost of packaging, local fish prices, and manageability. The short term periodic fluctuations of prices on the overseas markets can cause confusion if applied simultaneously in the day-to-day operations in the Solomon Islands. Therefore, an average price is maintained until the overseas prices show a new level of consistent averages. Then the local buying price from the fishermen is adjusted accordingly. Didao Development Corporation of Honiara was appointed by the RFEP III management to be the sole bulk buyer of fish from the fisheries centres. The company sells fish on the local market and has also tried exporting fish to Australia, Fiji and Guam. Other companies such as John Lee Enterprises, Kwaena Du Fisheries and Golden Star Fishing Company have expressed interest in purchasing fish from the fisheries centres and have tried trial exports to overseas markets as well.

When fish was offloaded at the fisheries centres, it was re-iced in freight eskis and sent to the designated market outlets in Honiara on the first available shipping transportation. The eskis used by the fisheries centres are made of moulded hard plastic and have a volume of 250 litres (Figure 15). The inside dimensions are, length 105.5 cm, width 58.5 cm and depth 46 cm.



*Figure 15: Type of eskis used by the fisheries centres*

The RFC fishermen were encouraged to target mainly the deep-water species to provide fish that were in demand on the overseas market and prevent oversupply of reef fish on the local market. The target species were purple cheek jobfish (*Pristipomoides multidentis*), gold-tail jobfish (*Pristipomoides auricilla*), red-tailed opakapaka (*Pristipomoides typus*), rosy jobfish (*Pristipomoides filamentosus*),

yellow jobfish (*Pristipomoides flavipinnis*), long-tail red snapper (*Etelis coruscans*), short-tailed red snapper (*Etelis carbunculus*), banded flower snapper (*Pristipomoides zonatus*) and long-jaw red snapper (*Etelis radiosus*). Most of the byproduct species were also marketed overseas conditional to the demand of fish at the time of export. Among the byproduct species were small toothed jobfish (*Aphareus rutilans*), green jobfish (*Aprion virescens*), blue-line large-eye bream (*Gymnocranius robinsoni*), large-eye bream (*Wattsia mossambica*), large-eye bream (*Monotaxis grandoculis*), kusakars fusilier (*Paracaesio kusakarii*), stones fusilier (*Paracaesio stonei*), amberjack (*Seriola rivoliana*), scarlet seaperch (*Lutjanus timorensis*), brown spot grouper (*Epinephelus chlorostigma*), brown stripe grouper (*Epinephelus morrhua*), and blue-tailed grouper (*Epinephelus microdon*).

The fishermen were further encouraged to develop mid-water fishing techniques, especially for fishing around FADs, in anticipation that the demand for tuna may transpire in the near future. Alternating between fishing methods to target deep-water and mid-water species also gives fish stocks time to recuperate and is good practise for sustainable fishing. The target species for mid-water fishing were mainly yellowfin tuna (*Thunnus albacares*) and bigeye tuna (*Thunnus obesus*) while the byproduct species were rainbow runner (*Elagatis bipinnulata*), wahoo (*Acanthocybium solandri*), and Marlin.

### 3.4 Workshops

From discussions with the RFEP III management team and experiences of similar rural fishing activities in the Pacific region, the Fisheries Development Officer anticipated that a standard range of training requirements and problems (with minor variations) would be encountered at the RFCs. A range of topics were prepared for presentation at one-day workshops to be carried out at each of the fisheries centre. This foresight proved to be correct as it was later observed during the project that each of the fisheries centres shared the same problems. These were mainly to do with the cost and availability of fuel, negligent attitude of the fishermen to meeting their loan repayments, the temptation to sell fish elsewhere other than the fisheries centre as contracted, baiting issues (cost and availability), poor organisation of fishing operations, and the tendency of the fishermen to use their fishing vessels for purposes other than fishing such as hiring the vessels as water taxis, personal transportation, and workboats for transporting garden goods to the markets. Afio was the only fisheries centre that had fishing grounds ownership disputes on their hands.

To address these issues at each of the centres and to act as an ice-breaking introduction, the Fisheries Development Officer began each term at the fisheries centre with the workshop. The participants at the workshops included the RFC fishermen as well as any interested parties from the local community. These workshops proved to be successful and generated a lot of interest and cooperation from the community. The one-day workshop focussed on safety at sea and small craft safe practises; deep-water bottom fishing techniques; FAD tuna and pelagic mid-water fishing methods (vertical longline, palu-ahi, and ika-shibi); night fishing using lights; fishing efficiency and sustainable fishing practises; preservation of fish on ice; fish handling (deep-water and pelagic species); and small fishing business management. A



display of assorted fishing accessories were displayed (Figure 16) and fishing gears for the different types of fishing methods were constructed using these components. Some topics were touched on briefly during the workshop but were later emphasised during the at-sea fishing operations.

**Figure 16: Sea safety and fishing equipment displayed during workshops**

The workshops culminated at identifying and addressing problems faced by the fishermen and the operations of the fisheries centres to determine whether advantageous solutions could be arrived at.



### *3.4.1 Basic management principles for small craft fishing operations*

After spending the first week at Seghe it was decided to gradually introduce the fishermen to some basic management principles for small craft fishing operations. During the workshop at Seghe this was briefly touched on but as the Fisheries Development Officer spent more time there, it became evident that the fishermen would benefit if the topic were elaborated on. At the other three fisheries centres this topic was given more emphasis during the workshops and elaborated on during the practical fishing operations.

The fishermen were briefed on the realities of commercial fishing and the hard work that was required of the individual. This meant going fishing on a regular basis and not only when they were short of cash; going fishing even when they were not in the mood; not returning when they felt cold, wet and miserable but only when the job got done; being competitive; planning ahead; and being a risk taker based on reasonable observations.

In managing his fishing business the fisherman needed to make sure that the boat was well equipped when it went to sea (had sufficient bait, ice, fuel, safety equipment etc) and was well serviced and maintained. The crew he selected to work with him needed to have the right skills and attitude or be trained to develop these. The boat has to do regular trips. If the fisherman himself cannot go, he has to send someone reliable to fish for him and pay the fisherman on a percentage of the catch. His crew have to be happy, well rewarded and prepared to work hard. While the fishing business has to be sensitive to community and cultural perspectives, it has to be done without seriously affecting the commercial aspects. The fishermen were told to make sure that their crew got paid each trip, that the bills and the RFEP III loan got paid, enough money was put aside for the next fishing trip, ensure that sufficient cash was put aside for unexpected expenses and that the basic records were maintained of the fish catches and financial transactions.

### *3.4.2 Small craft operations, sea safety and basic navigation*

During the workshop the fishermen were made aware of the common problems of small craft handling and safety at sea issues. While most of these fishermen were experienced boat handlers, familiarity may tend to make them take for granted some of the basic boat handling and safety procedures and this may eventually lead to carelessness.

Small boat safety issues were discussed to encourage the fishermen to safeguard themselves when proceeding on fishing trips. The topics included small boat safety awareness focussing on subjects listed in the SPC small boat safety checklist. The fishermen were encouraged to maintain this checklist even though they had become familiar with their operations or when the checklist procedure becomes monotonous. The checklist chores required the fisherman to check out the weather before going on a fishing trip, inform someone of his intended destination, ensure that the engine is in good working order, carry spare fuel, engine tools and spares, anchor and rope, sea anchor, alternative propulsion, compass, signalling device, floatation device, drinking water, food, First Aid kit, knife, bailing device and canopy for shade.

An array of sea safety equipment and fishing gear was displayed to give the fishermen an idea of what gears he would eventually have to procure to become a professional boat handler. Basic navigation and chart reading was also touched on during the workshop and this was elaborated on during the planning of fishing trips and while en route to fishing grounds. While the ability to read charts is good for the fisherman's safety, it also assists him to select fishing grounds before he makes a fishing trip.

## **3.5 Seghe fisheries centre activities**

Project operations were based in Seghe for 31 days (22 July to 22 August 2003). During this time a range of activities were undertaken. A total of 18 fishermen were trained, with five of these being RFC fishermen and the other 13 being crew on the boats.

### 3.5.1 Seghe fisheries centre — Marovo lagoon, Western Province

The Seghe fisheries centre was established in 1984 as a token of goodwill from the Government of Japan (through JICA) to the Government of the Solomon Islands. Improper management and lack of maintenance led to the centre shying away from active commercial operations to being a fisheries division administrative outpost only. In late 1994, the centre was rehabilitated under RFEP I to be a base for commercial operations for Marovo fishermen. Since the centre commenced operations in late 1994/early 1995, it has undergone several disruptions due to local politics and disputes. It was also identified that the centre was not operating profitably and the Western Provincial Government hesitated to take full control of the centre until a better picture was presented.

RFEP III management handed over the centre (Figure 17) to the Marovo Fishermen's Association (MFA) in December of 2002 after a Memorandum of Agreement was signed between the Western Provincial Government and the association. Under the conditions of the agreement, the MFA assumed full responsibility for running the centre while the assets of the centre remained the property of the Western Provincial Government. At the time the Fisheries Development Officer was in Seghe, the centre was still under caretaker management by the RFEP III, while the MFA organised itself to take on full management of the centre or come to a decision on the option to select a private enterprise to operate the centre.



*Figure 17: The Seghe Rural Fisheries Centre*

The centre was supplied with fish provided by five fishermen covered under the RFEP III loans scheme, several canoe fishermen, and about five fishermen with privately owned boats. The centre had two generators to provide electricity to run a 24-block ice plant and an ice crusher; a 23 foot (7 m) Yamaha fibreglass skiff; and 2 outboard motors (Johnson 25 and 9.9 HP). Much of the original building complex is not in use except for the office, processing room and the managers resident. The main building complex consists of an office room, a fishing gear storeroom, workshop area, fisherman's recreation room and residential area. Beside the main complex is a two-bedroom house that is used by the centre manager and another two-bedroom house that is unused and in need of major maintenance.

Fishing operations and export of fish to Honiara are dependant on merchant ships in the area. Although ships frequent the area at least once a week, the schedules were very irregular and sometimes there were no trips for two weeks at a time then suddenly there were two to three ships in a week, then no ships the following week. Disrupted shipping schedules continued to interfere with Seghe's shipment of fish to Honiara. Whenever the centre manager accumulated eskis of fish, he ran the risk of not being able to get the fish across to Honiara and would have to try to sell this locally. Seghe has a good local sales outlet, which is mainly to the logging companies, but this is not big enough to absorb the fish that can be caught during the fishing season. In order to coordinate fish accumulation and transportation of the fish to Honiara, the centre manager had to constantly keep track of the shipping traffic by getting in direct contact with the shipping agents at least twice a day. Even then, last minute changes frequently occurred. At one stage, Seghe had consistent shipping service to the area but due to the economic downturn caused by the ethnic tension, there were less people travelling between destinations causing the shipping companies to cut back on trips. Also, many of the vessels involved in the merchant trade in the Solomon Islands were well over 30 years old and poorly maintained so the breakdown rates of these vessels were quite high.

It is anticipated that with the easing of the ethnic tension and the application of stricter maritime laws to upgrade the merchant vessels, the irregularities will diminish as more and more people travel between Honiara and Seghe.



### 3.5.2 Overview of operations

After carrying out a preliminary assessment of the fishermen's records, a group meeting was arranged to discuss the activities to be undertaken in the following weeks. Fishing trips were organised so that each RFC fisherman could be assessed in their fishing operations and be advised on improvements if or when necessary. Mainly the deep-water bottom fishing method was concentrated on, while alternate fishing methods such as mid-water fishing techniques and night fishing were demonstrated. Night fishing using lights was conducted concurrent with the deep-water fishing trips. An overhead kerosene lamp was used for the light fishing method. Although it was effective in drawing Indian mackerel bait (*Rastrelliger kanagurta*) and pelagic fish to the vessel, the method had to be aborted as the kingfish (*Scomberomorus commerson*) were attacking the deep-water species that were being caught. The concepts of the light fishing method and the construction of the necessary gears were generally understood. Diagrams of the components for the construction of the pelagic fishing gear were left at the Seghe Fish Centre as reference material for the fishermen should they acquire the proper accessories for constructing these gear.

It was observed that since starting their fishing operations, all five fishermen had fallen into debt by crediting fuel from local merchants and have been trying to catch up ever since. After each fishing trip, a substantial amount of the fish money goes to the repayment of fuel leaving little for loan repayments, money to take home and funds for the next trip. Each trip the fishermen undertook, they hoped for an extra good catch that would bring in sufficient funds to cover their credit and put them back on a better footing, but the magic trip never eventuated. Insufficient knowledge on how to manage their fishing business properly, especially the step by step planning of allocating their income for a smooth operation, led to poor management of funds in the earlier stages. In addition, abuse of the grace period allocated to them for building working capital contributed to the predicament they found themselves in. The 'off-season' period especially made operations difficult for the Seghe fishermen.

The Seghe fishermen have all shown that they are competent as far as catching fish goes. They each have the ability to produce good catches when the season picks up again but they will have to change their attitude towards meeting their loan repayments and planning their fishing trips.

Towards the end of the Fisheries Development Officer's time in Seghe, the fishermen showed signs of improved commitment. Each of them acknowledged their lack of commitment earlier and was prepared to make amends. Although they had cancelled all the debts owed to the local merchants they still lacked sufficient capital to fund their next trips. In trying to prevent them from falling into debt again, several ideas were suggested. The most practical for them was to accumulate funds by selling market goods from their gardens or sell reef fish, caught from the closer inshore areas, on the local market or to the fisheries centre.

### 3.5.3 Planning fishing operations

In trying to encourage the Seghe fishermen to revamp their operations and to gain confidence, the Fisheries Development Officer outlined for them the commitments that they would have to meet each fishing trip. The fishermen were briefed on how to plan their fishing operations and how to put aside funds so that they would have sufficient cash flow to keep them operable.

The Seghe fishermen were given the following realities to ponder. Where previously they were only conducting overnight trips and returning with whatever catches was landed for the night, they would now have to remain fishing until they were sure that at least their expenses for the trip were covered and that there would be sufficient funds for the following trip. They have several options to plan their fishing trips. These are based on the distances from fishing grounds and the fuel required to safely access these grounds. Aside from the loan repayments, the fishing trip expenses remain the same depending on how many litres per trip were used. Two sets of expenses were laid out for 30 litre trips and 40 litre trips and the options given in different scenarios using these expenses.

Since each fisherman is obligated to make a loan repayment of SID \$1504 per month, this meant that SID \$376 should be paid each week. The fishermen were given the option of covering their loan repayments by doing either two or three trips a week. If two trips are done each week then a deduction, of at least SID \$188 should be made each trip. If three trips are carried out in a week then at least SID \$125 should be deducted each trip to meet the weekly loan repayment of SID \$376 per week.

Approximate expenses/trip/week:

For a 30 litre trip — fuel \$195 @ \$6.50/litre, ice \$30 @ \$10/block 3 blocks/trip, miscellaneous \$50. Total \$275 per trip.

For a 40 litre trip — fuel \$260 @ \$6.50/litre, ice \$40 @ \$10/block 4 blocks/trip, miscellaneous \$50. Total \$350/trip.

**Scenario 1:** If 3 x 30 litre trips are conducted per week, the break even is \$400/trip. That is \$275 for expenses plus \$125 for loan repayment. The fishermen will have to catch at least 61.5 kg of premium fish per trip to break even.

**Scenario 2:** If 2 x 30 litre trips are done each week, the breakeven is \$463/trip. That is \$275 for expenses plus \$188 for loan repayments. The fisherman will have to catch at least 71.2 kg of premium fish each trip to break even.

**Scenario 3:** If 3 x 40 litre trips are done per week, break even is \$475/trip or 73.08 kg of premium fish per trip. That is, \$350/trip expenses plus \$125 for loan repayments.

**Scenario 4:** If 2 x 40 litre trips are done each week, the break even is \$578/trip or 82.8 kgs of premium fish per trip. That is, \$350/trip expenses plus \$188 for loan repayments.

It should be noted that the price for premium or grade one fish is \$6.50 per kg; the price of fuel is also \$6.50/litre. Therefore, for whatever litres of fuel the fisherman purchases for his fishing trip, he will have to catch the same amount of grade one fish to cover the fuel cost alone.

#### *3.5.4 Fishing trips/grounds*

Since going on record by supplying fish to the Seghe Fish Centre and the commencement of loan repayments, the five Seghe fishermen collectively accumulated 66 fishing trips from 7 May to 23 August 2003. Thirty of these fishing trips were achieved during the month the Fisheries Development Officer was in Seghe compared to 36 trips previously undertaken by the fishermen (7 May to 22 July). Since 7 May, 3087.8 kg of fish were recorded. Of this, 1915.3 kg (average 53.2 kg/trip) was caught before the Fisheries Development Officer's arrival and 1172.5 kg (average 39.1 kg/trip) during the Fisheries Development Officer's time in Seghe. Details of the fishermen's activities can be found in Appendix B.

Fishing activities were pursued in three main fishing grounds. These fishing grounds were around the Helebar area, Uipi area and across at Tetepare Island. A fourth fishing area was identified around Loturana point but this has yet to be properly verified when the fishing season picked up again. The Loturana fishing ground is approximately 8.5 nm from Seghe, while the next closest proven fishing grounds are the Helebar and Uipi area, both approximately 14.5 nm away from the Seghe fisheries centre. The Tetepare fishing ground is 19 nm from the centre. The fisherman required at least 30 litres of fuel to fish the Helebar and Uipi area — their main fishing grounds. The 30 litres safely covered the fishing trip and allowed the fishermen at least five litres to troll for bait. The Tetepare fishing ground, which is the furthest away, required at least 35 to 40 litres for a safe trip. During the strong easterly and north-easterly winds, only the Helebar area was suitable for fishing as there was sufficient shelter for the fishermen to continue fishing. When strong southerly and westerly winds set in, only the Uipi grounds were protected. Tetepare was the better fishing ground but could only be accessed in good weather and when the fishermen had sufficient funds to purchase fuel for the trip.

### 3.5.5 *Acquiring bait at Seghe*

The Seghe fishermen were highly dependent on the Solomon Taiyo skipjack catcher boats to provide them with rejected skipjack to use for their bait. Normally a trade off was done with the crew of the catcher boats — tobacco for rejected tuna. Although the fishermen sometimes net sardines and scads for their bait or troll for skipjack on their way to and from the fishing grounds, a lot of reliance was placed on the catcher boats. The cost of purchasing sufficient fuel to include trolling operations deterred the fishermen from catching their own bait on each fishing trip. Sometimes the weather condition disallowed them from venturing too far off the shoreline to pursue the skipjack schools. One solution to this problem could be the strategic deployment of FADs in appropriate areas, as this will enable the fishermen to go directly to the FADs to troll or jig for bait and will reduce fuel consumption.

## 3.6 **Afio fisheries centre activities**

Project operations were based in Afio for 14 days (29 August to 12 September 2003). During this time a range of activities were undertaken. A total of 16 fishermen were trained, with four of these being RFC fishermen and the other 12 being crew on the boats.

### 3.6.1 *Afio fisheries centre — Malaita Province*

The Afio Fisheries Centre (Figure 18) is located adjacent to the South Malaita administration centre and is therefore subjected to frequent interactions with the public sector. This centre was also a previous Japanese installation established in 1983 then rehabilitated in 1997 under the RFEP II. The centre is situated in northwest Mara Masike (Small Malaita) and managed by a centre manager and an assistant. A fisheries officer is also temporarily stationed at the centre. The Malaita Provincial Council and the Afio Fishermen Farmers Association (AFFA) are working closely with the RFEP III management in directing the centre towards autonomous management and sustainable viability. Fish supplies to the centre is mainly supported by 12 AFFA fishermen who have been issued loans under the loans scheme and five other private boat owners who mainly troll for skipjack to be used as bait by the loans fishermen in their deep-water fishing operations. The centre also buys fish from canoe fishermen provided these fishermen store their fish on ice in smaller eskis that can be carried in canoes.



**Figure 18: Afio Rural Fisheries Centre**

The infrastructure at the centre is much the same as at Seghe but is better maintained and utilised. Several shipping companies have ships transiting through the centre on their way to and from ports in South Malaita — sometimes as many as three ships a week albeit irregular schedules. Despite this, at least one trip a week transits the centre on return to Honiara so the centre has good accessibility to the fish markets in Honiara.

### 3.6.2 *Overview of operations*

During the 14 days that the Fisheries Development Officer was in Afio, 12 accumulated fishing trips were undertaken by four of the twelve fishermen who were issued loans. A fifth fisherman commenced fishing and initially concentrated on catching skipjack tuna for local sales and for bait, while putting together gear for deep-water bottom fishing. Four of the remaining seven fishermen each recorded only one fishing trip prior to the Fisheries Development Officer's arrival, while three have not recorded any fishing trips yet. While occasional trolling was carried out to obtain bait for the fishing trips, the Afio fishermen concentrated on deep bottom fishing targeting the species required by the markets in Honiara. Fishermen who were not committed to the loan scheme mainly caught skipjack tuna for bait

and local sales. The skipjack averaged 2.5 kg in weight and were bought by the fisheries centre for SID \$10/fish and resold to the loans fishermen and the locals for SID \$15/fish. The fishermen preferred this arrangement as this saved them time and fuel in having to troll for their own bait and it guaranteed them bait before a fishing trip instead of having to go through all the preparations and expenses only to find that the sea was too rough to chase after skipjack schools or that no schools could be spotted when they finally got out to the fishing grounds.

Since beginning fishing operations in mid May, before the Fisheries Development Officer arrived and during the time he was there, the fishermen had by 10 September 2003, accumulated 85 fishing trips that resulted in a total catch of 5529.6 kg. The accumulated funds generated during this period were SID \$32,205.72. Accumulated total fuel expenses came to SID \$15,053.72, cost of ice at SID \$1890 while purchase of bait stood at around SID \$2550. The accumulated loan repayments from 29 instalments came to SID \$11,660. Only four fishermen showed positive income over expenses figures while the other eight ended up with negative figures. It should be noted that none of the fishermen have kept up to their commitments of meeting the exact loan repayments on time. If they had, all would have extreme negative figures. With the current standing, the accumulated total income after expenses came to SID \$1052. The four fishermen accumulated a positive figure of SID \$6992.60 while the other eight fishermen ran up an accumulated loss of SID \$5940.60. A detailed account of the fishermen's performance can be found at Appendix C.

### 3.6.3 FAD construction and deployment at Afio

Skipjack schools can be located daily in the Afio fishing grounds, but since the fishing grounds are so vast, the skipjack schools were sometimes located further away rather than nearer. Pursuing the school caused the fishermen to use up more fuel and increased their expenses for the trip. To alleviate the fishermen's burden of having to scout wide areas, the fisheries centre manager requested that a FAD be deployed in an appropriate area.

A basic designed FAD was constructed using the material on hand at the fisheries centre. Because this FAD was constructed with the available equipment at the fisheries centre and its design was not properly researched and tested, its durability still needs to be ascertained over a period of time. The anchor was constructed from a 200 litre drum filled with cement; leaving it to cure for a week before deployment. While filling the drum with cement, a used car tyre was embedded in the cement to act as the holding lug for the anchor (Figure 19). The FAD mooring consisted of 560 m of bright orange polypropylene rope. The bottom 360 m leading to the anchor was 12 mm diameter and the top 200 m was 10 mm diameter. The ropes were spliced together and a 2 kg swivel was connected 140 m from the surface to act as a counter weight to hold the buoyant line underwater. The mooring was shackled onto 10 m of 19 mm chain at the anchor end and rove through 3 buoys on the surface. Two of the buoys were 300 mm hard plastic floats and the third float was 360 mm hard plastic. The buoys were secured 1.5 m apart (Figure 19). Old cotton net aggregates were lashed onto the rope to a depth of 10 m (Figure 19).

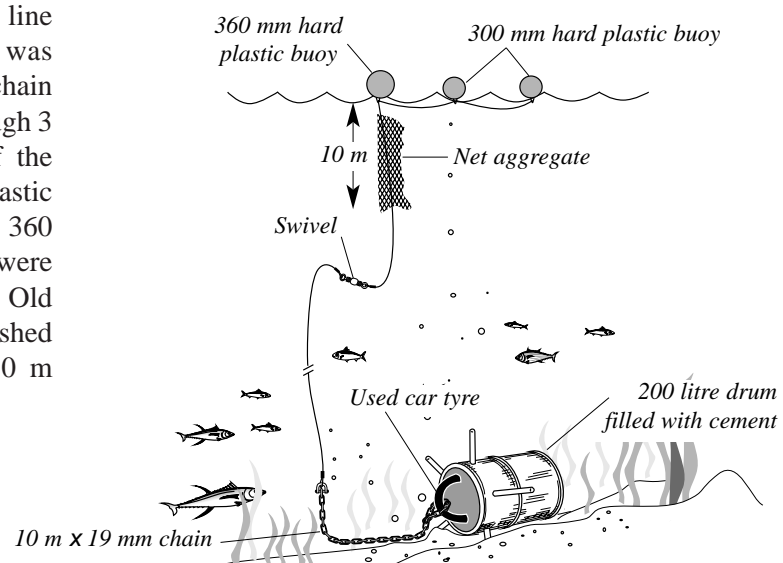


Figure 19: FAD mooring design used at Afio



**Figure 20: Echo sounder positioned in the front of a skiff**

Both skiffs motored slowly out to the chosen deployment site. The skiff with echo sounder and anchor stayed over the intended mooring spot. The second skiff deployed the floats and the rope (Figure 21) in a circle around the first skiff ending up at the skiff with the end of the mooring line. The bottom hardware was then attached to the anchor, and the rope attaching the anchor to the skiff cut to release it.



**Figure 21: Rope being paid out during the FAD deployment**

Although this FAD was constructed with makeshift gear, it proved effective in accumulating fish and was frequented by the fishermen only two weeks after it was deployed. The Fisheries Development Officer was not around to witness the productivity of the FAD as he had left Afio the same day, after deploying the FAD. Reports of the FAD productivity were relayed to the Fisheries Development Officer after he had returned to Honiara from Semeghe. The fish caught from around the FAD at this time were mahi mahi, wahoo, skipjack tuna, frigate mackerel and small yellowfin tuna.

#### **3.6.4 Fishing grounds**

Fishing activities were mainly in three fishing grounds. These were the fishing grounds off the eastern and western coasts of southeast Malaita Island and Mara Masike Island and the southeast coast of Mara Masike Island. There is good potential for deep-water bottom fishing in these fishing grounds. All three fishing grounds have shallow water shelves (100 to 300 m) extending up to 3.5 nm offshore, but the AFFA need to address local politics to keep these fishing grounds continuously accessible to all fishermen in the proximity.

Survey of the fishing grounds by echo sounder showed that the grounds were covered with rich coral growth. This was confirmed by lowering a leadline with a hollowed out bottom filled with plastercine. On retrieving the leadline, pieces of live fan and lace coral and sand were stuck on the plastercine. These grounds were mainly off the eastern and western coast of Malaita Island and Mara Masike, and off the south-eastern coast of Mara Masike. The fishing grounds have proved to produce good catches of the commercial deep bottom species during the fishing season. The fisheries centre is closer to the western fishing grounds, only 1.5 nm away, while the eastern grounds are approximately 18 nm away. To fish the eastern and south-eastern grounds, the fishermen close to Afio required at least 35 litres to cover the distance. Fishermen who lived closer to the eastern grounds needed more fuel as they were required to come all the way from the east to the fisheries centre to load ice, return to the eastern fishing grounds, back to the centre after the fishing trip, then back to their homes in the east. This required a minimum of 45 litres of fuel.



In a recent development, a group of land owners laid claim to the fishing grounds off the western coast and, in a formal letter, informed the Afio fisheries centre to notify its fishermen to refrain from carrying out fishing activities in the area. Threats were also made to dismantle the FAD that was deployed in the area. The landowners were represented by an individual who was also a police officer based at the Afio Police post. The contents of the letter had a blackmail connotation to it since the closure of the grounds were conditional to the RFEP III loans committee seriously considering a request for loans by applicants from the area. Besides this disruption to the western fishing grounds, landowners from the eastern coast were also laying claims to the seas surrounding their coast and were rumoured to be contemplating closing off these fishing grounds to outsiders. The reasons for this was much the same as that of the western fishing grounds supposed owners — for the loans committee to also distribute loans to fishermen from their area.

### 3.7 Semeghe fisheries centre activities

Project operations were based in Semeghe for 15 days (17 September to 2 October 2003). During this time a range of activities were undertaken. A total of 15 fishermen were trained, with five of these being RFC fishermen and the other 10 being crew on the boats.

#### 3.7.1 Semeghe fisheries centre — Florida Islands, Central Province

The Semeghe fisheries centre (Figure 22) was established in 1996 and is the only fisheries centre to be fully constructed by the Rural Fishing Enterprise Project. The centre is approximately 30 nm north-northwest of Honiara and is situated next to Niu Mala village on Mbokonumbeta Island in the Florida Islands group. It is ideally located for supplying fish for local sales in Honiara and for the export market through flights out of Henderson International Airport. Although shipping services do not transit the centre, the proximity to Honiara is close enough to organise viable independent runs to transport full eskis of fish across. Honiara is only two hours away by a 40 HP outboard driven vessel.



*Figure 22: Semeghe Rural Fisheries Centre*

A local company, Auaua Industries owned by the Honourable Paul Maenu Minister for Agriculture, manages the fisheries centre. The company appointed a centre supervisor, an assistant, a machine operator and a security guard to operate the site. The fisheries centre complex is smaller than the Japanese built fisheries centres at Seghe, Afio and Yandina but is more practical and sufficient as an introduction fish base that can be extended if the need arises. The centre has an ice making machine that turns out 26 x 15 kg blocks in 12 hours, a generator, a storeroom and an administration office under one building. There is also a fuel-storage shed, a jetty and a two-bedroom manager's apartment on the fisheries centre compound.

Five RFC fishermen operate out of the fisheries centre as well as several canoe fishermen and fishermen with their own boats. Three of the RFC fishermen received a 40 HP Yamaha engine each with a standard package of fishing equipment that included three fishing reels, fishing lines, fishing hooks, sinkers, swivels, snaps, raincoats, water container, anchor, anchor rope, anchor chain, and flares. The other two fishermen requested the whole package that included the fishing gear package, a 30 HP Yamaha outboard engine each and a 21 foot (6.4 m) fibreglass round cabin boat each. The fishermen are members of the Sandfly Fisherman's Association (SFA).

At the time the Fisheries Development Officer was at Semeghe, the centre was only servicing the fishermen by selling them blocked ice at SID \$18 per block. Other services such as purchases of fish, marketing and transportation of fish to Honiara, were temporarily postponed until the managing company could devise a proper system to maintain a viable operation.

### *3.7.2 Overview of operations*

The training schedule at Semeghe was slightly different to that of the first two fisheries centres visited earlier, Seghe and Afio. Since the five fishermen covered under the RFEP loans scheme had only recently obtained their equipment, more attention was given to setting up their vessels for maximum working efficiency, and to carrying out surveys of their fishing grounds. The one-day workshop was held on the second day of the Fisheries Development Officer's arrival in Semeghe and a general plan was prepared for the activities to be undertaken in the coming two weeks. Since only two of the fishermen had new boats, these were set up first. The other three fishermen still required repairs to be done on the vessels that they had acquired during the previous RFEP II phase. In the meantime, two of the three fishermen were given temporary joint use of the fisheries centre's fibreglass 23 foot (7 m) Yamaha skiff while the other was loaned a fibreglass round cabin boat owned by the fisheries base management company. The original vessels owned by the three RFC fishermen were still at the fish base at the time the Fisheries Development Officer departed Semeghe, but arrangements had already been made to get the boats across to Honiara as soon as practical so that full repairs could be undertaken.

Weather conditions dictated the fishing trips that could be done in Semeghe. During bad weather, the fishing grounds around Semeghe were exposed to strong easterly and south-easterly winds and seas were rough all round. This rough weather made it difficult and dangerous for the fishermen to do complete fishing trips and return with good catches. If, at the end of a fishing trip, the catch that was brought back was not worth the trip to Honiara, the fish was sold to one of their colleagues.

The five RFC fishermen and the fisheries centre management need to work out a procedure in which to carry out the fishing operations at Semeghe. Although the fisheries centre was only performing the periphery duty of providing ice for the fishermen and not purchasing fish from them, the fishermen came up with their own system of transporting the fish across to Honiara to be sold. Two of the more enterprising RFC fishermen alternated in getting the fish across to Honiara. Because the fisheries centre was not prepared to purchase fish from the fishermen, the two fishermen bought extra blocks and supplied these to canoe fishermen to do part of their fishing for them. The RFC fishermen did their own fishing for the deep-water species then bought the catches from the canoe fishermen as well as from their RFC colleagues who did not have full eskis. When a payload was achieved, the two RFC fishermen transported the eski(s) to Honiara and sold the fish at the main fish market or to prearranged outlets.

Although this practise is not according to the conditions laid out by the RFEP III loans committee, the fishermen have been given leeway to do this for the time being while the managing company developed a system to be used by the fisheries centre. This lightened the load of the other RFC fishermen as it relieved them of the burden of crossing to Honiara. While this arrangement may seem suitable for some of the fishermen, it does not complement a RFC operation and can be a deterrent to the development of fisheries in the area. It might also be difficult to break the enterprising fishermen away from their own system once the fish base decides to implement its full supportive role.

The RFC fishermen need to be able to source income from the centre especially when their catch is not big enough to take across to Honiara or the weather becomes too rough to make the crossing. If bad weather persists for days on end even the two fishermen who make the crossing may eventually face huge losses since they would not be able to sell the fish that they had already accumulated. If the fisheries centres were to accumulate the fish brought in by the fishermen, a larger weight would be on hand to attract larger vessels to make the two hours crossing to transport the eskis of fish back to Honiara.

The RFEP III management team should discuss these issues with the management company that is currently running the fisheries centre so that it can be operated along the guidelines initially put in place by the RFEP III management team. Under the RFEP III loan conditions, the fishermen are obliged to sell fish to the fisheries centre so therefore, theoretically, the fisheries centre also has an obligation to meet the needs of the fishermen.

### *3.7.3 Fishing grounds*

Since engaging in commercial fishing during the earlier years, the Semeghe fishermen predominantly fished the grounds northwest of Buena Vista Island for deep bottom species and the closer grounds for shallow water species. Several of the RFEP III fishermen were also involved in the RFEP II stage, so the previously known fishing grounds were continually revisited and few of the fishermen risked trying out the closer fishing grounds unless they were accidentally required to do so. During the project, because of the unpredictable weather conditions, the closer fishing grounds to the east, northeast and west of Mbokonumbeta Island were tried out. Since the fishermen regularly frequent these grounds for trolling and shallow water species, they were surprised to find that the deep-water species could also be caught in the deeper waters within 6 nm of the fisheries centre. When these grounds were surveyed, several areas produced bottoms with live coral and when fished they were found to have the deep-water species sought by the export markets. Seven complete fishing trips were carried out resulting in 404.1 kg of fish being caught. Four other fishing trips were aborted when conditions made it impossible to stay out on the fishing grounds. Appendix D provides a detailed account of the fishermen's performance.

While adverse weather conditions made it difficult to do much deep-water bottom fishing successfully, the night fishing methods using lights proved to be a salvation for the fishermen. This was done in sheltered waters off Mbokonumbeta Island, Sogonara Island and Mangalonga Island.

## **3.8 Yandina fisheries centre activities**

Project operations were based in Yandina for 16 days (7 to 23 October 2003). During this time a range of activities were undertaken. A total of 33 fishermen were trained, with 11 of these being RFC fishermen and the other 22 being crew on the boats.

### *3.8.1 Yandina fisheries centre — Central Province*

The Yandina fisheries centre (Figure 23) is situated on eastern Mbanika Island in the Russell Islands group. It is close to the RIPEL (Russell Islands Plantation Enterprises Limited) main administration centre and ideally located near the main wharf area. The fisheries centre was established with the same building plans that JICA had for the Seghe and Afio fisheries centres and is equipped with a generator and an ice making plant that churns out a tonne of flaked ice over 24 hours.



*Figure 23: Yandina Rural Fisheries Centre*



The fisheries centre is fortunate that the Russell Islands is home to one of the biggest copra plantation estates in the world, currently managed by the RIPEL Company. Workers for the company are settled on the island so the fish centre has a good local market to distribute fish to. Having an adequate local market relieves the fisheries centre of first caught fish so that by the time a vessel arrives to transport the fish to Honiara only fresh fish will be available to be shipped. As with the other fisheries centres, the local market can only absorb a small portion of the fish caught by the RFC fishermen so reliable transportation links to Honiara are important. Presently, no regular transportation links exist for Yandina and shipping contact is mainly reliant on vessels transiting the port on the way to the Western Province or returning from the Western Province to Honiara.

The centre manager is an employee of the Provincial Council. Eleven RFC fishermen who are generally from Loun Island, Alokan Island and Maruloan Island supply fish to the centre. At the time the Fisheries Development Officer visited the area, the fishermen had only recently acquired their equipment covered under the loans scheme and were in the process of building up capital to fund their fishing trips.

### *3.8.2 Overview of operations*

On the second day after arrival at Yandina, the Fisheries Development Officer proceeded with the one-day workshop to ascertain the fishermen's situation and get feedback on the fishing ground areas they would like surveyed using the echo sounder. During discussions with the fishermen, the problem of fuel shortages and extravagant fuel prices surfaced again. Irregular shipping schedules were also identified but since Honiara is only 2 to 3 hours outboard ride away, the possibility existed to organise fish transportation trips to Honiara should an urgent need arise.

Since some of the fishermen had only recently acquired their loans package, their vessels were brought down to the centre and work was done on constructing wooden reel racks and deck flooring for the vessels. In the meantime the other fishermen set about accumulating funds to purchase fuel for their fishing trips. Since all the fishermen had their own favourite fishing spots, areas that were not previously fished were surveyed and assessed. Many of the areas in the 150 to 300 m depth range showed good potential for fishing grounds. The echo sounder showed that these areas had an abundance of fish and when line tested, the sizes caught in the different areas were noted. At the end of the first week the fishermen were briefed on the findings of the surveys and the areas with the bigger sized fish were noted. These areas were the first to be fished while waiting for the new season to begin.

The fishermen were made aware of the need to maintain sustainable fishing practises by practising conservative fishing. It was encouraging to note that this point went down well and, as several of these fishermen were also involved in the RFEP I and II stages, they expressed their experiences on how fish stocks in their favourite areas diminished very quickly when only one spot was fished continuously regardless of the size of fish that were caught.

### *3.8.3 Fishing grounds*

Sixteen fishing trips were conducted in sixteen days resulting in a catch of 549.15 kg. Appendix E provides a detailed account of the fishermen's performance. Several of the fishing trips were hampered by fuel shortage and poor weather conditions. This led to fishing being done only in the closer fishing grounds. Fortunately, this situation improved towards the end of the Fisheries Development Officer's time in Yandina. Fish catches began very slowly with several of the first trips resulting in poor results. The later fishing trips produced 80 to 100 kg of fish. Although there was evidence of an abundance of fish on the fishing grounds that were surveyed, these were mainly small, and a lot of time was taken in moving on to survey other areas that might have bigger sized fish. The whole of the eastern grounds and Mane Island were teeming with goldtail jobfish, purple cheek jobfish, rosy jobfish and short tail snapper, but unfortunately these were all small, and smaller hooks had to be used to identify the fish in these fishing grounds. In all the eastern grounds and Mane island fish response was almost instantaneous. As soon as the fish species was identified, another fishing ground was tried in the hope that the fish size would be bigger. The advent of the new fishing season will see these areas providing good catches.

The bigger sized jobfish and short tail red snapper were eventually found to be around the Victoria reef area and the western side of Pavuvu Island, especially around Maruloun Island. Most of the fishing trips were conducted during daylight hours with the early part of the evening taken up in travelling back towards the fisheries centre. Although only demonstration light fishing trips were carried out, the fishermen were encouraged to consider these methods in sheltered waters as an alternative in times of adverse weather conditions in the open deep-water fishing grounds.

Since the fishermen were familiar with the deep-water fishing methods and were good boat handlers, more attention was given to practising quick turn around fishing methods using the fishing accessories that were part of their gear. They were all encouraged to take note of the fishing months and the catch patterns that occurred over these months especially noting the areas in which different species were caught and the sizes of fish in these areas. Vessel cleanliness and proper fish icing methods were practised.

Three attempts were made to reach a FAD located in the eastern fishing grounds, but due to adverse weather conditions, the FAD could not be reached and the vertical longline fishing method had to be done in the leeward side of the islands. These trials were sufficient to demonstrate to the fishermen the effectiveness of vertical longline and how it could be used in conjunction with their deep-water fishing trips. On all three trials the vertical longline was deployed in deeper waters (500 m plus) and the vessel returned to the shallower depth (up to 300 m) to do deep bottom fishing. While the deep bottom fishing was carried out, the drift rate of the vertical longline was monitored and checked every four hours. Scads jigged from the Yandina wharf the previous night were used as bait.

The deep bottom catches in the first few trips were unprofitable but the trips served as good fishing ground surveys which allowed for an elimination process to be carried out to distinguish fishing grounds with larger sized fish and those with smaller fish. The Russell Islands fishing grounds were easier to survey and monitor. The north, south, east and west fishing grounds were checked out within four days to determine the catch potential. The RFC fishermen were instructed to work together as a group and to share genuine fishing information so that they could all maintain consistent fishing operations.

### 3.9 Summary of all fishing results

Table 1 provides a summary of the results of fishing activities, the weights of fish landed to the RFCs in each location and the value of the catch, while detailed figures can be found at Appendix F. It should be noted that on the same weekend that the Fisheries Development Officer departed Yandina, four of the fishing vessels returned with approximately 400 kg plus of deep-water species accumulating a total of 8 eskis of fish at the fisheries centre and creating an anxiety to get the fish out on the first available ship to transit the area.

**Table 1: Summary of project fishing operations, the weight of catch landed at the RFCs and the value of the catch**

Location	Days at location	Fishing trips	Catch sold (kg)	Value (SID)
Seghe	31	30	1172.50	5955.10
Afio	14	12	731.30	4241.88
Semeghe	15	7	404.10	2078.90
Yandina	16	16	549.15	2959.85
<b>Total</b>	<b>76</b>	<b>65</b>	<b>2857.05</b>	<b>15,235.73</b>

Deep-water bottom fishing was the main method used by the RFC fishermen, with vertical longlining demonstrated at each location and night fishing methods also introduced. Table 2 summarises the catch for each method by location, with a details breakdown of the species composition at Appendix F. As can be seen in Table 2, deep bottom fishing activities produced the most catch, making up over 85 per cent of the fish landed for sale to the fishing centres.

**Table 2: Catch by fishing method and location for the project fishing activities, with all weights in kg.**

Method	Seghe	Afio	Semeghe	Yandina	Total
Deep bottom fishing	1139.70	569.30	272.10	501.40	2482.50
Vertical longlining	4.80	0.00	0.00	43.75	48.55
Night fishing/jigging for pelagics	28.00	162.00	132.00	4.00	326.00
<b>Total</b>	<b>1172.50</b>	<b>731.30</b>	<b>404.10</b>	<b>549.15</b>	<b>2857.05</b>

It should be noted that the weights in Tables 1 and 2 are the actual weights of fish sold, although different processing was required for different species. Grade 1 fish, which included all the deep-water snappers, were sold whole with guts in. Grade 2 fish, which covered shallow water species and pelagics, were sold whole with guts out. Some exceptions to this were that kingfish (Grade 1 species) was sold headed and gutted and yellowfin tuna was sold gilled and gutted. There were also size limits on some species, such as barracuda and trevally, which had to be less than 5 kg in weight, and groupers, which had to be less than 50 kg each.

During deep bottom fishing activities, monofilament snoods were used to avoid catching sharks. This was very effective with no sharks caught. However, two hammerhead sharks and 1 blue shark were taken on the vertical longline, with these sharks retain by the crew on the skiffs.

During the project no proper records were kept of the amount of fish that were caught and used for bait. These were mainly skipjack tuna caught through trolling, and Indian mackerel and squid through jigging using lights at night. The four centres collectively used approximately 488 kg of skipjack for bait during the project. The RFC fishermen at Seghe used approximately 225 kg skipjack of which 75 kg they caught themselves and 150 kg were obtained from the tuna catcher boats and other fishermen not attached to the RFCs. At Afio the RFC fishermen caught approximately 45 kg of skipjack for bait and purchased approximately the same amount from other fishermen. The RFC fishermen at Semeghe caught and used approximately 53 kg skipjack for bait while at Yandina approximately 90 kg of skipjack was caught by the RFC fishermen and about 30 kg were purchased. In addition to the skipjack bait, at least 20 kg of Indian mackerel and 3 kg of squid were caught and used for bait at each of the centres.

### **3.10 Common issues that were identified**

During the course of the fishing activities the Fisheries Development Officer identified several common issues and tried to address these at each location.

#### *3.10.1 Planning of fishing trips and finding new fishing grounds*

Even though the RFC fishermen at Seghe and Afio had started fishing under the loan scheme in mid May 2003, their fishing operations were poorly planned and not economically viable. Part of the Fisheries Development Officer's assignment was to work out economic means for the fishermen to carry out their fishing operations while reinforcing their attitudes to keeping their commitments to the RFEP loans scheme. The fishermen at Semeghe and Yandina though, had only recently received their loans package so much of the work was focussed on trying to get them off on the right foot. At Semeghe and Yandina, the fishermen wanted to concentrate more on locating fishing grounds before they ventured on trips of their own. The preliminary surveys that were carried out, later served them well. By the time the Fisheries Development Officer left the latter two fisheries centres, fish catches were on the increase.

Trying to locate fish in bad weather was physically demanding and expensive. Even with breaks in the weather, the fishermen hesitated to cross over to exposed areas in case they were caught out should the weather unpredictably change for the worse. Time was spent surveying sheltered areas that were not previously fished due to the abundance of fish in favoured areas that were now not producing or exposed to weather conditions. Several areas were located and the fishermen were encouraged to keep shifting grounds every trip until the catches started to show signs of consistency and the sizes of fish increased. The fishermen were encouraged to use light fishing methods to capitalise on the abundant kingfish, trevally and barracuda that can be caught in the sheltered shallower waters. Indian mackerel can also be abundantly caught for bait, local sales, and home consumption. The light fishing method worked well in Afio and Semeghe while at Seghe and Yandina the fishermen were still in the process of acquiring lamps suitable for the fishing operation.

During the project, adverse and unpredictable weather conditions were experienced and the main body of fish shifted location from the known fishing spots to unknown areas. Depth soundings and bottom surveys were carried out to try to widen the chances of determining where the fish had moved. The sea bottom information was collected using a sounding leadline that was basically a lead sinker, with plastercine on the end, attached to a graduated rope. This combined with information derived from an echo sounder enabled the Fisheries Development Officer to determine the type of seabed in a particular area. The echo sounder was not used at Seghe because it was still in transit while the Fisheries Development Officer was there. However, with the arrival of the echo sounder, the seabed at Afio, Semeghe and Yandina were easily surveyed. It was unsurprisingly found that areas that had live coral produced the best results in fish catches while the sandy area and dead coral areas were not as productive.

### *3.10.2 Off-season effects*

The RFC fishermen that first began their fishing in the month of May started off with impressive catches but the catch rate started to decline not long after. This decline in the later months was attributed to the off-season period setting in and was not indicative of less effort on the fishermen's part. In fact, more effort was achieved in the later months compared to the earlier months. Observations by the Fisheries Development Officer during the fishing trips led to him advising the fishermen to quickly capitalise on catching fish before the off-season fully set in. Recorded data proves that the off-season months are normally between July and November. Adverse weather conditions during these months are an influence on the off-season effects as some areas still had substantial fish stocks but accessibility to these areas was restricted.

Weather conditions affect the currents, so the deep-water fish may have followed the change of current and relocated to another spot. In areas such as Seghe, Semeghe, and Afio, these spots were hard to locate since the fishing grounds stretched over a vast area and it was difficult to cross from one area to the other. As was evidenced during the fishing trips, after a good catch was achieved from a particular spot, a second attempt in the same spot a day or two immediately after resulted in a catch of less than half of what was achieved earlier. This may indicate that the main body of fish had moved on and only the slow moving tail end of the stock was hauled up leaving less fish to be caught in the second and third attempt. These same spots during the season times proved to provide good catches consistently. However, the Russell Island group had mostly sheltered waters that enabled surveys to be carried out. After several failed attempts in the eastern part of the group, the fish were located in the western part of the islands. Although there was a lot of fish on the eastern side of the island, these were all small and not good market value. The fish that was located in the western area were all good market sized fish.

### *3.10.3 Location of RFEP III fisheries centres*

One of the observations made during the project was that the fisheries centres that cater for small craft (similar to the 21ft (6.4 m) round cabin boats used in the RFEP III project) were more effective for fishing communities living within the immediate area of the centre and possibly up to 10 nm from the centre. While the fisheries centres were there to provide the fisherman with ice and to act as an outlet

for their fish, the location of the centre was important to the success of the fisherman's fishing operations.

Fishermen based close to the centres have better cost effective operations than those living further away. In preparation for a fishing trip, the fisherman would have to come to the centre to load up ice, therefore, the fisherman's normal travelling pattern on a working trip would be to leave home for the fisheries centre to load ice, depart the fisheries centre for the fishing grounds, return from the fishing grounds to the fisheries centre to unload fish then leave the fisheries centre for home. For the fishermen living further away from the fisheries centre, travelling to and from the fisheries centre was a costly affair. In some cases, as in Afio, the fishermen living on the eastern coast were closer to the fishing grounds than to the fisheries centre, which was 10 nm or more away. To fish the eastern grounds, these fishermen had to travel to the centre to load up ice then return all the way back to carry out their fishing operations. At the end of the fishing trip they had to travel all the way back to the fisheries centre to offload their fish then the same distance back to their houses in the east. For a fisherman living 10 nm away, this meant a minimum of 40 nm travelling that required at least 60 litres of fuel which cost around SID \$400 when purchased from the local merchants.

To avoid this, fishermen living further away from the centres needed to plan their operations more carefully than those who were closer. These fishermen had to make several consecutive fishing trips in a week in order to reduce their travelling time to the fisheries centre. On the first trip for the week, these fishermen had to face the initial expenses of the long trip from their homes to the fisheries centre to pick up their eskis and load ice. After this initial journey for ice, the fishermen filled up ice for their second and consecutive trips after discharging fish at the end of each trip. In this way the fisherman did not have to make a special trip to the fish base each time to load ice for the consecutive trips but he needed to go fishing as soon as he had rested in order for the ice not to be wasted. The fishermen who lived closer to the fisheries centre did not require such a quick turn around and if the weather conditions suddenly changed he had the option of remaining at home till the weather blows over. The distant fisherman however, faced the risk of loss on the purchase of ice, but taking this risk is still cheaper than having to make a special trip to the fish base to load ice before every fishing trip.

#### **4. DISCUSSION AND CONCLUSIONS**

Although it was difficult to achieve good results at the start of the project due to the adverse weather conditions, things started picking up towards the end of the project resulting in the fishermen gaining more confidence in the management of their vessels and their fishing operations. Previously when faced with bad weather in the open sea fishing grounds, the fishermen would return to base or to their homes to wait for the weather to improve. At times this resulted in a cancelled trip that proved costly to the fisherman, especially after he had already paid for his ice and fuel. Towards the end of the project when faced with bad weather, the fishermen would return to sheltered waters to carry out night fishing using light to attract fish, the target species being kingfish (*Scomberomorus commerson*), which fetched Grade 1 price on the market. Lamps (kerosene pressure type) were not a part of the original loans package, which should be changed in the future. There was a general improvement all round. The fishermen were more aware of their role in getting their fish product in top condition to the end market, fishing operations were better planned, the fishing gears and vessels were better maintained, and recommended fish handling practises were followed. The fishermen were also aware of the need to manage their finances better.

Operations of the RFC's have a better chance of success now than previously, however, several problems need to be ironed out to enhance the possibilities of success. The major problems are fuel costs and availability, irregular shipping, unavailability of fishing gear, and the fishermen's hesitance to make loan repayments. The threat to the fishing grounds by landowners is a real problem that can determine the viability and longevity of any RFC. Although these matters were addressed during the project, an enduring solution is yet to be arrived at.



## 4.1 Fuel

The cost and availability of fuel was a major obstacle that hindered the RFC fishermen from running their fishing operations consistently. Fuel supplies were inconsistent and the prices charged by the local merchants were exorbitant. In some places the commission on fuel sold to the public was as much as 70 to 100 per cent. The cost of fuel at Seghe was SID \$6.50/litre, while Afio, Semeghe and Yandina had prices fluctuating between SID \$7.00 and \$7.50 per litre. Unreliable fuel supply and these exorbitant prices charged by the local merchants increased the cost of operations and, when fuel sold by the local merchants ran out, the fishing operations ceased. The RFEP management, Fisheries Division, Fishermen's Associations and the fishermen need to come up with a solution that would assure consistent fuel supplies at competitive and realistic prices.

While the ideal situation would be to have fuel supplied by the fish centre, previous experiences proved that this was a risky exercise and resulted in a huge loss for the centres, particularly after the fishermen had taken fuel on credit and failed to meet the expenses after an unsuccessful fishing trip. To overcome this dilemma and to relieve the fish centre from the responsibility of being the prime source of supplying fuel, the fishermen should be encouraged to form a reliable group from among their ranks in which to pool resources to create capital to purchase their own fuel. The fuel can then be resold back to them with a low commission (20 to 25%) added on to the cost price and handling charges. When sufficient funds have accumulated from the commission on sales, the fishermen can then recoup their initial contributions, but it must first be ensured that the required capital for continuous purchase of fuel is maintained in the purchasing pool. The fishermen can recoup their contributions as soon as sufficient funds are available or wait until the end of the year to share the profits made from the commissions. Sharing of the commissions can be done according to the percentage of fuel each fisherman had purchased from the fuel pool over the year. The responsibilities of managing and recording the distribution and sale of fuel can be delegated to the Fish Centre manager.

While the fishermen need to devise methods of saving fuel or accumulate fuel of their own, the Fisherman's Association affiliated with the RFC's should also devise methods of lightening the fuel burden on the fishermen. Selling them the fuel at cost price with a small commission for the association's troubles should be considered but a detailed study on this possibility should be carried out before hand.

The RFEP III management, Provincial Government, Ministry of Fisheries and Marine Resources, and the Fisherman's Associations can assist the rural fishermen by devising a fuel concession allotment for the fishermen to take advantage of. In the interest of developing the rural commercial fisheries, the group should get together to brainstorm ideas. A basic idea to ponder is:

- To register all fishermen supplying the RFC's to a particular fuel depot in the RFC vicinity and issue them ID cards and license number.
- The government can then assign a special permit to the designated fuel depot to sell fuel to the registered rural fisherman at a much lower price than what is offered to the general public.
- The group could seek assistance from other government departments for fuel and petroleum products tax concessions for the rural fishermen and work a system to incorporate this into the depots that are designated to sell fuel to the fishermen.
- The fuel allotted to each fisherman should be sufficient for three average fishing trips a week.
- Each time a fisherman draws fuel from the depot, this is deducted from his allotted fuel balance for the week. Unused fuel from the depot for one week cannot be carried forward into the next week; in other words, fuel cannot be accumulated at the depot for bulk use later.
- Before a fisherman fills fuel at the depot he needs a signed permit from the RFC manager. The permit should be only valid for the day.
- Before the RFC manager issues a permit he has to ensure that the fisherman has already loaded ice and is prepared for the fishing trip.

- Penalties should be put in place for fishermen caught abusing the system. In the first instance the fisherman should be suspended for an agreed term and for a second offence the fisherman's fuel privilege should be withdrawn.
- Appropriate studies should be carried out on the ideas presented or on similar scenarios that would alleviate the rural fishermen of the fuel burden.

Deployment of FADs in strategic areas will also assist the fishermen greatly to reduce their fuel consumption by reducing their bait searching scope to the specific areas where the FADs are located. Therefore, at least one if not two FADs should be deployed near each of the RFCs to assist their fishermen. Possible positions at Seghe are latitude 08° 44.0'S, longitude 157° 57.0'E for the Helebar grounds and latitude 08° 22.4'S, longitude 157° 57.0'E for the Uipi fishing grounds. For Yandina the best positions would be latitude 09° 10.0'S and longitude 159° 19.0'E, and latitude 08° 57.0'S and longitude 159° 02.0'E.

#### **4.2 Fishing gear and outboard spare parts**

The fisheries centres do not have any fishing gears and accessories in stock. These need to be stocked up and sold to the fishermen at reasonable prices. The fishermen have only basic tools and sometimes resort to using rudimentary gear to carry out their repairs. Some obtain their own fishing gear and outboard spare parts from Honiara but this is not consistent. Although the fishing gears and outboards that the fishermen now have are fairly new, practical fishing principles require that these are repaired and maintained while the fishing operations are underway or after every trip. To do this the fishermen should have ready access to fishing gear components and basic spare parts. It would be expensive and impractical to stock the fisheries centres with a general assortment of fishing gears but the fisheries centres should at least have the necessary components required for the type of fishing that the RFC fishermen engage in, that is; trolling, deep bottom fishing methods, mid-water fishing methods, night fishing methods using lights, and basic spare parts for the outboards supplied under their loan package. Most of the components for each fishing method are the same so the list of items to be stored at the fisheries centres is not unmanageable and not difficult to keep track of. A list of the basic fishing gears required at each RFC can be found in Appendix A.

The cost of the fishing gear and outboard spare parts also needs to be looked at. Possibly the Loans Committee can look at subsidising the fishing gear or at least selling it at cost to reduce the burden on rural fishermen.

#### **4.3 Fishermen's loan repayments**

At the moment, most of the fishermen attached to the RFC's are not meeting their loan repayments. This was partially due to the loans being taken out close to the off-season, and the fishermen having to first settle their fuel debts with the local merchants. Theoretically it would have been effective if, as part of the loan package, the fishermen were given sufficient capital in the form of fuel allotment to kick start their fishing trips but judging from how careless they were in utilising the grace period for building up funds, some of them would still come up with an excuse for not getting down to serious fishing operations. Prompt repayments of the loans issued to the fishermen are beneficial to the expansion of the number of fishermen that operate from a fisheries centre. The fund for loans given out to the fishermen at the various RFC's is a revolving fund, so the expansion of fishermen attached to the fisheries centre is dependant on the present fishermen paying off their loans as soon as possible. Every time a loan is repaid this sets up the fund for another applicant to take out a loan for a fishing vessel and gear.

The RFC fishermen had a careless attitude towards loan repayments. Several of the fishermen have had consistent good fishing trips since they obtained their loans package but the percentage of income they put back into loan repayments were very small. Several fishermen were lax in going out on fishing trips and sometimes make trips when their mood or the weather suited them. While some fishermen had the

urgency to earn as much as they could, they were tight in forking out money for loan repayments. The other fishermen just had no urgency to speak of. The RFEP management should take immediate steps to encourage the RFC managers to play a leading role in motivating and captaining the RFC fishermen in their operations and meeting commitments. The first step would be to collect all of the catch records from the different RFC fishermen to see who has been effected by the off-season low catches and who just has not been repaying their loan. There should be constant communications between the RFC managers and the fishermen and if the RFC manager identifies someone who is deliberately not cooperating because he has a different agenda for his loaned equipment, then the RFC manager should not hesitate to notify the RFEP Loans Committee so that appropriate action can be taken. The fishermen need to develop some sense of urgency to be able to succeed in repaying their loans; otherwise the failure rate will be high.

In discussions held with each fisherman, it became evident that when taking on the commitment of accepting the loans, all of them did not realise the level of commitment that would be required of them. They definitely understood the gravity of the sum involved but they did not realise that they would also have to make drastic changes to their lifestyles to meet the commitment of their loan repayments and the time frame in which each payment should be made. When the possibility existed for them to own boats, the excitement of the concept made the attached commitments seem trivial and something easy to achieve. While they understood that they would have to repay a certain sum consistently each month, the contemplation of maintaining a regular payment did not sink in. This is a point that needs reinforcing, and the RFEP staff should look at putting out east to understand leaflets or pamphlets to clearly outline the loan scheme. The harsh realities of their current situation were revealed to them now, where as it was not fully stressed at the time of taking out the loan. They could no longer be the villager that can go fishing when the weather and the situation suited them but would have to stick to a rigid system that engaged them in fishing activities during the times that they usually spend doing other leisure activities. To meet the loan repayments on time and to maintain a successful fishing business the fishermen have to change their leisurely village lifestyle to a lifestyle similar to people working in urban areas.

#### **4.4 Irregular shipping**

Inter island shipping in the Solomon Islands is unreliable and very inconsistent. Most of the merchant ships make unscheduled trips to areas where the fisheries centres are located so the managers of the fisheries centres have to constantly monitor the ships movements by being in radio contact with the shipping agents or the ship's captain. Shipping schedules is one of the few operations procedures that the fisheries centre managers have no control over. The fisheries centres are dependant on the shipping companies to get their fish shipped to Honiara. The only way that the fisheries centres can be totally independent is if they have a boat specifically designated to picking up the eskis of fish from the fisheries centres, but whether it would be profitable to operate such a vessel for the sole purpose of shipping eskis to Honiara has to be researched. The option to charter a small vessel once a week to do a chain pickup from Seghe, Yandina, Semeghe and Afio, should be researched. The RFEP management should make an arrangement with the local merchants in or en-route to the areas where the fisheries centres are located to take supplies to the provinces and return with the eskis of fish. With the coming new fishing season, the fisheries centres are expected to accumulate more fish in a shorter time.

#### **4.5 Fishing ground dispute**

A major concern that needs to be addressed as soon as possible is the threat of fishing rights ownership. The threat of fishing ground owners segregating their fishing grounds from others and using their fishing grounds as a blackmail tool can close down all the fisheries centres in the Solomon Islands if it is allowed to persist. The Fisheries Division should define the exact legal implications of the landowners' claims and take assertive action to discourage the recurrence of this type of threat. The current ban on the western fishing grounds in Afio, placed by the supposed fishing ground owners is a serious occurrence that needs to be attended to diplomatically but decisively. Already the Afio eastern ground landowners have laid claim to the areas off their shores and they are also contemplating closing



off these grounds. If this trend continues it may spread to the other provinces and will pose a serious threat to the harmonious running of the established fish centres.

The grievance voiced by the landowners is that they want people from their area to be granted loans that are issued by the RFEP III. By closing the grounds, they are holding the RFEP III Loans Committee to ransom — give their people loans or the grounds remain closed. Should the Loans Committee capitulate to this threat, the danger exists that if their fishermen were not able to meet the loan commitments and the vessels were repossessed, what is to stop the landowners from closing off their grounds again? The government and RFEP need to work together to clarify the rights of landowners, and discourage the segregation and closure of open water fishing grounds.

It must first be determined whether these landowners have jurisdiction over the offshore areas that are used by the fishermen to carry out their deep-water fishing activities. If the landowner's claims are justifiable, then the Fisheries Division should implement an awareness programme that would guarantee the full cooperation of the rural community with the RFCs, otherwise none of the RFCs will have a hope of continuing. There is a strong suspicion that even though the villagers know that the RFEP III are issuing loans for fishing vessels, they still regard the loans in the same light as aid grants. It was noticed that the complainants have boats of their own. If they were genuinely interested in the fishing venture why are these vessels not being used for fishing? Why has no one from the group approached the fisheries centre to enquire about fishing gears or at least request the fisheries centre to obtain gear for them? Possibly, the attraction of obtaining boats and engines through the loan scheme is the driving force behind their demands.

If an awareness programme is carried out it should be stressed that the loans are serious business arrangements and failure to meet its requirements will definitely result in repossession of the vessels and gear. Possibly, a few examples may have to be made in the near future, as some of the loans recipients are carelessly attending to their responsibilities.

## **5. RECOMMENDATIONS**

The following recommendations are based on the practical outcomes of the fishing operations, the outcomes of the project, and the experience of the Fisheries Development Officer. It is recommended that:

- (a) Kerosene pressure lamps be included in the loan package of gear for future RFEP III loans;
- (b) The Fisheries Division and RFEP III staff research the concept of the fishermen forming into small groups and contributing to set up a fuel supply pool that would give them consistent fuel supply at reasonable costs;
- (c) The RFEP Loans Committee research the possibility of appointing designated depots close to RFCs to sell fuel to the RFC fishermen on similar conditions mentioned in Section 4.1;
- (d) The Fisheries Division, RFEP III management, Provincial Government, Fishermen's Associations, and a private sector business entrepreneur representative form a brainstorming committee to discuss methods of alleviating the operational financial burdens of commercial rural fishermen especially in regards to reducing the cost of fuel sold to the RFC fishermen;
- (e) At least one or two FADs should be deployed on or near each RFC's fishing grounds;
- (f) The fisheries centres be stocked with fishing gear appropriate for the type of fishing methods conducted by fishermen at the centres and basic outboard engine spare parts for the outboards provided under their loans package;
- (g) The Loans Committee should seek concessions on fishing gears ordered for fishermen in the rural sector;

- (h) In light of the off-season effects, the RFEP III Loans Committee should carefully peruse the catch records of all RFC fishermen to compare with fishermen whose catches were badly affected and enforce strict measures on those who have done well but did not commit to the loan repayments;
- (i) The rural community in which the RFC's are located should be briefed on the RFEP loans scheme and a distinction clearly defined between the loans scheme and aid grant, with possibly leaflets or posters made up and distributed;
- (j) The management of the fisheries centres research options, other than the unreliable merchant ships, for transporting fish from the fisheries centres to Honiara, including the possible chartering of a vessel or obtaining a vessel specifically for servicing the fisheries centres;
- (k) In order to deal with the fishing ground disputes, an accurate study should be made on the exact laws that apply to fishing ground ownership rights;
- (l) The RFEP III management, Fisheries Division and the Provincial Governments have a serious meeting with the people of the rural areas and clearly discourage segregation and closure of open water fishing grounds; and
- (m) The RFEP III management, Fisheries Division and the Provincial Governments and Councils should consider implementing an awareness programme on fishing ground rights and highlighting the functions of the fisheries centres and their benefits to the region.

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## Standard safety and fishing gears checklists for RFEP III boats

## Standard checklist

Item	No. Required	No. Checked
Outboard engine	Check to be in good working condition	
Alternative propulsion	1 set of sails, pair of oars, spare engine, etc.	
Engine tools and spares	1 set	
Sea anchor	1	
First aid kit	1	
Bailers	2	
Water	20 litres	
Flotation device	1 for each crew	
Signalling device	1 parachute flare, 1 orange smoke signal, 1 mirror.	
Torch and batteries	1 set	
Hand held compass	1	
Grapple anchor x 15kg	1	
5 m x 12 mm chain	1 length	
Anchor rope	300 to 500 m	
Polyform float or 300 mm hard plastic float with stainless-steel shackle	1	
Tarpaulin	1 x 10 m <sup>2</sup>	
Food	Sufficient for fishing time	
Hand crimping tool	1	
'D' Sleeves	1 pkt x 100	
Wire cutter	1	
Bait knives	2	
Chopping knife	1	
Bleeding knives	1	
Oilstone or file	1	
Stainless steel fish spike	1	
Fish club	1	
Lantern	1	
Kerosene	5 litres	
Eski with ice	1	
Cotton hand gloves	1 pair for each crew	
Gaffs	2	

**Additional equipment to be carried for deep bottom fishing**

FAO Samoan handreels with 500 m of 250 lb (115 kg) test line	3	
Sinkers	6 x 1.0 kg and 3 x 0.5 kg	
Ready made trunk lines	3 spare	
100 lb (45 kg) test lines for snoods	At least 100 m	
Circle hooks 11/0, 12/0, 13/0	20 of each size	
2/0 crane swivel with inter-lock snap	20	
3-way swivels	20	
2/0 barrel swivels	20	

**Additional gears to be carried for vertical longline fishing**

FAO Samoan handreel stand	At least 1	
FAO Samoan handreel spools with 2.5 to 3.0 mm vertical longlines wound on	According to the number of vertical longlines to be set. Each line should be at least 400 m.	
Branchlines	20 branchlines per vertical longline	
300 mm longline floats	1 per vertical longline	
Bamboo flag poles with weighted bottom	1 per vertical longline	
Sinkers	1 x 2.0 to 3.0 kg per vertical longline	

**Additional gear to be carried for night fishing with lights**

Kerosene pressure lamp and/or 12 V underwater light	1	
Kerosene fuel for lamp	5 litres	
12 V car battery	1 fully charged	
15 lb (6.5 kg) jigging line	2 spools	
100 lb (45 kg) jigging line	2 spools	
Jigging sinkers for 100 lb (45 kg) line	3	
Sabiki rig	5 sets	
7 x 7 1.08 mm flexible stainless steel wire	5 sets x 1.5 m with 11/0 hook and 2/0 inter-lock crane swivels crimped on.	

Summary of Seghe fishermen's catch and expenses details from 17/05 to 21/08/2003

Name	H. Gamutu	R. Miller	G. Vulita	P. Ngira	A. Ghally	Total
Number of trips	16	8	14	21	7	66
Catch (kg)	444.1	419.8	803.2	1185.8	234.9	3087.8
Catch income	2258.9	2306.35	4115.05	5766.75	1171.45	15618.5
Cost of fuel	2376.5	1544.5	2760	4092.5	1153	11926.5
Cost of ice	380	260	460	640	180	1920
Total loan repayment	242.1	339.93	863.65	893.79	135.04	2474.51
Income after expenses	-739.7	161.92	31.4	140.46	-296.59	-702.51
Total fuel used (litres)	371	243	435	635	182	1866
Total ice used (blocks x 10.5 kg)	34	22	42	60	18	35.2
Average catch/trip	27.76	52.48	57.37	56.47	33.56	45.53
Average price/kg	5.09	5.49	5.12	4.86	4.99	5.11
Average income/trip	141.18	288.29	293.93	274.61	167.35	233.07
Percent of income deducted for loan repayment	10.72	14.74	20.99	15.50	11.53	Av. 14.70
Number of loan instalments paid	7	5	10	10	4	36



Summary of Afio fishermen's catch and expenses details from 14/05 to 10/09/2003

Name	Paul S	John K	Melkio	Peter M	Peter H	Peter P	Moses L	Clement	Kevin P	George	Elvis P	Berry S	Total
Number of trips	12	18	28	22	1	1	1	1	1	0	0	0	85
Catch (kg)	677.85	1821.35	1107.95	1761.25	41.5	8.7	44.1	12.4	54.5	0	0	0	5529.6
Catch income	3839.05	10982.08	5849.53	10605.06	238	52.1	263.6	38.3	338	0	0	0	32205.72
Cost of fuel	2730.1	4767.8	2522.71	4183.36	153.8	115.35	153.8	76.9	349.9	0	0	0	15053.72
Cost of ice	240	540	560	440	20	20	20	20	30	0	0	0	1890
Bait	360	540	840	660	30	30	30	30	30	0	0	0	2550
Total loan repayment	970	1750	1200	2500	150	1890	0	900	1000	400	300	600	11660
Income after expenses	-461.05	3384.28	726.82	2821.7	-115.8	-2003.25	59.8	-988.6	-1071.9	-400	-300	-600	1052
Total fuel used (litres)	290	620	328.05	544	20	15	20	10	30	0	0	0	1877.05
Total ice used (blocks x 10.5 kg)	24	54	56	44	2	2	2	2	3	0	0	0	189
Average catch/trip	56.49	101.19	39.57	80.06	41.5	8.7	44.1	12.4	54.5	0	0	0	65.05
Average price/kg	5.66	6.03	5.28	6.02	5.73	5.99	5.98	3.09	6.20	0	0	0	5.82
Average income/trip	319.92	610.12	208.91	482.05	238	52.1	263.6	38.3	338	0	0	0	378.89
Percent of income for loan repayment	25.3	15.9	20.5	23.6	63.0	0	0	0	0	0	0	0	36.2
Number of loan instalments paid	4	3	6	7	1	3	0	1	1	1	1	1	29

Summary of Semeghe fishermen's catch and expenses details from 17/09 to 02/10/2003

Name	John Rerei	Ben Vulo	Clement Suba	Alfred Sosori
Number of trips	3	2	1	1
Catch (kg)	119.0	118	78.5	88.6
Catch income	602.5	623.50	378.5	474.4
Cost of fuel	346.5	231	154	154
Cost of ice	140	120	60	60
Income after expenses	116	272.50	164.5	260.4
Total fuel used (litres)	45	30	20	20
Average catch/trip	39.7	59	78.5	88.6
Average price/kg	5.06	5.28	4.82	5.35

Summary of Yandina fishermen's catch and expenses details from 07/10 to 22/10/2003

Name	John Ngaobua	Daniel Lapiti	Belser Wheatly	Robert Mangauli	John Dickson	Joseph Fagi	Bonnyface Lovasa	Billy Meniga	Mark Apa
Number of trips	1	1	3	2	1	2	4	1	1
Catch (kg)	31.45	9	183.6	23.2	21.9	49.8	192.6	15.70	21.9
Catch income	190.35	58.50	923.85	121.8	108.2	281.00	1086.45	81.50	108.2
Cost of fuel	192.50	115.5	577.50	323.40	115.5	269.50	823.90	115.5	192.50
Cost of ice	42	42	126	84.00	42	84	168	42	42
Income after expenses	-44.15	-99.00	220.35	-285.6	-49.30	-72.50	94.55	-76	-126.30
Total fuel used (litres)	25	15	75	42	15	35	107	15	25
Total ice used (kg)	42	42	126	84	42	84	168	42	42
Average catch/trip	31.45	9	61.2	11.6	21.9	24.9	48.15	15.70	21.9
Average price/kg	6.05	6.50	5.03	5.25	4.94	5.64	5.64	5.19	4.94

Breakdown of species and income earned during the project time in each location

Species	Seghe		Afio		Semeghe		Yandina		Total	
	Kg	SID \$	Kg	SID \$	Kg	SID \$	Kg	SID \$	Kg	SID \$
Bottom fishing catch										
Longtail snapper ( <i>Etelis coruscans</i> )	54.10	351.65	28.15	182.98	0.00	0.00	16.50	107.25	98.75	641.88
Short tail snapper ( <i>Etelis carbunculus</i> )	399.60	1998.00	49.50	247.50	21.00	105.00	184.35	921.75	654.45	3272.25
Rosy jobfish ( <i>Pristipomoides filamentosus</i> )	157.50	1016.25	79.40	516.10	17.00	110.50	99.55	655.05	353.45	2297.90
Purple cheek jobfish ( <i>Pristipomoides multidentis</i> )	0.00	0.00	0.00	0.00	37.00	240.50	50.50	328.25	87.50	568.75
Gold tail jobfish ( <i>Pristipomoides auricilla</i> )	0.00	0.00	0.00	0.00	22.00	143.00	1.60	10.40	23.60	153.40
Small tooth jobfish ( <i>Aphareus rutilans</i> )	39.50	194.50	2.25	11.25	8.00	40.00	2.40	12.00	52.15	257.75
Long-jaw red snapper ( <i>Etelis radiosus</i> )	64.30	390.50	0.00	0.00	0.00	0.00	5.00	25.00	69.30	415.50
Large eye Bream ( <i>Wattsia mossambica</i> )	51.30	255.50	2.00	10.00	9.00	45.00	15.40	77.00	77.70	387.50
Blue-line Large-eye bream ( <i>Gymnocranius robinsoni</i> )	49.20	246.00	0.00	0.00	2.00	10.00	27.30	136.50	78.50	392.50
Kusakars fusilier ( <i>Paracaesio kusakarii</i> )	0.00	0.00	15.40	77.00	0.00	0.00	0.00	0.00	15.40	77.00
Stone's fusilier ( <i>Paracaesio stonei</i> )	0.00	0.00	1.75	8.75	0.00	0.00	34.90	174.50	36.65	183.25
Amberjack ( <i>Seriola rivoliana</i> )	22.40	112.00	0.00	0.00	18.50	92.50	0.00	0.00	40.90	204.50
Scarlet sea perch ( <i>Lutjanus timorensis</i> )	42.50	212.50	8.50	42.50	0.00	0.00	17.40	87.00	68.40	342.00
Kingfish ( <i>Scomberomorus commerson</i> )	3.00	19.50	292.00	1901.25	32.00	208.00	0.00	0.00	327.00	2128.75
Brown stripe grouper ( <i>Epinephelus morrhua</i> )	42.60	170.40	9.25	37.00	2.50	10.00	6.20	24.80	60.55	242.20
Blue tailed grouper ( <i>Epinephelus microdon</i> )	19.00	76.00	0.45	1.80	0.00	0.00	0.00	0.00	19.45	77.80
Brown-spot grouper ( <i>Epinephelus chlorostigma</i> )	41.30	165.20	0.00	0.00	11.00	44.00	0.00	0.00	52.30	209.20
Green jobfish ( <i>Aprion virescens</i> )	2.50	12.50	0.00	0.00	0.00	0.00	0.00	0.00	2.50	12.50
Red bass ( <i>Lutjanus bohar</i> )	16.00	62.00	0.00	0.00	19.60	78.40	1.70	8.50	37.30	148.90
Indian mackerel ( <i>Rastrelliger kanagurta</i> )	27.10	83.70	0.00	0.00	26.50	35.00	0.00	0.00	53.60	118.70
Trevally ( <i>Caranx ignobilis</i> )	17.20	68.80	29.00	116.00	32.00	128.00	3.50	14.00	81.70	326.80
Barracuda ( <i>Sphyrnaena genie</i> )	9.30	37.20	20.00	80.00	13.00	52.00	12.40	49.60	54.70	218.80
Spangled emperor ( <i>Lethrinus nebulosus</i> )	21.00	104.50	0.00	0.00	0.00	0.00	2.20	11.00	23.20	115.50

Dogtooth tuna ( <i>Gymnosarda unicolor</i> )	24.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.00	72.00
Coral trout ( <i>Plectropomus leopardus</i> )	0.80	5.20	0.00	0.00	0.00	1.00	6.50	0.00	0.00	0.00	1.80	11.70
Maori wrasse ( <i>Cheilinus undulatus</i> )	1.50	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	7.50
Black trevally ( <i>Caranx lugubris</i> )	4.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	16.00
Mixed shallow water species	20.50	102.00	30.05	101.25	0.00	0.00	0.00	11.50	46.75	62.05	250.00	250.00
Banded flower snapper ( <i>Pristipomoides zonatus</i> )	1.50	7.50	1.60	8.00	0.00	0.00	0.00	9.00	45.00	12.10	60.50	60.50
Yellowfin tuna ( <i>Thunnus albacares</i> )	8.00	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	32.00	32.00
<b>Sub-total</b>	<b>1139.70</b>	<b>5818.90</b>	<b>569.30</b>	<b>3341.38</b>	<b>272.10</b>	<b>1348.40</b>	<b>501.40</b>	<b>2734.35</b>	<b>2482.50</b>	<b>13243.03</b>		

Vertical longline catch												
Barracuda ( <i>Sphyræna genie</i> )	4.80	19.20	0.00	0.00	0.00	4.10	16.40	8.90				35.60
Yellowfin tuna ( <i>Thunnus albacares</i> )	0.00	0.00	0.00	0.00	0.00	12.25	56.10	12.25				56.10
Wahoo ( <i>Acanthocybium solandri</i> )	0.00	0.00	0.00	0.00	0.00	27.40	137.00	27.40				137.00
<b>Sub-total</b>	<b>4.80</b>	<b>19.20</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>43.75</b>	<b>209.50</b>	<b>48.55</b>				<b>228.70</b>

Night fishing/jigging catch												
Kingfish ( <i>Scomberomorus commerson</i> )	2.00	13.00	101.00	656.50	81.00	526.50	0.00	0.00	184.00	1196.00		
Trevally ( <i>Caranx ignobilis</i> )	12.00	48.00	31.00	124.00	22.00	88.00	0.00	0.00	65.00	260.00		
Barracuda ( <i>Sphyræna genie</i> )	0.00	0.00	30.00	120.00	16.00	64.00	4.00	16.00	50.00	200.00		
Rainbow runner ( <i>Elagatis bipinnulata</i> )	1.00	4.00	0.00	0.00	6.00	24.00	0.00	0.00	7.00	28.00		
Red bass ( <i>Lutjanus bohar</i> )	13.00	52.00	0.00	0.00	7.00	28.00	0.00	0.00	20.00	80.00		
<b>Sub-total</b>	<b>28.00</b>	<b>117.00</b>	<b>162.00</b>	<b>900.50</b>	<b>132.00</b>	<b>730.50</b>	<b>4.00</b>	<b>16.00</b>	<b>326.00</b>	<b>1764.00</b>		
<b>TOTAL</b>	<b>1172.50</b>	<b>5955.10</b>	<b>731.30</b>	<b>4241.88</b>	<b>404.10</b>	<b>2078.90</b>	<b>549.15</b>	<b>2959.85</b>	<b>2857.05</b>	<b>15235.73</b>		