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**SPC-ACIAR Aquaculture Workshop
20-21st July 2001, New Caledonia**



Proceedings of the SPC-ACIAR Aquaculture Workshop
Held 20-21st July 2001 at SPC, New Caledonia.

Introductory Procedures

The workshop was opened by **Dr Tim Adams** who welcomed all participants.

Mr Barney Smith then provided a brief presentation on behalf of ACIAR, outlining the significance of the SPC region and the current aquaculture initiatives to its programmes. Currently, ACIAR existing program of bilateral and multilateral projects in aquaculture related research involve 6 SPC countries (Fiji, Tonga, Kiribati, Solomon Islands, New Caledonia, Papua New Guinea). There are also long standing co-operative arrangements in place with SPC, FFA and ICLARM.

Aquaculture is of growing interest to ACIAR and now represents 60% of budget, with ongoing collaborative aquaculture projects in 11 Asia-Pacific countries. Aquaculture is one of the fastest growing food production sectors in the world with Asia and developing world accounting for most of this growth. The opportunity for aquaculture to play a major role on poverty alleviation was substantial, particularly at small community level.

It was noted that aquaculture has had a chequered history in the Pacific with many initiatives that had not borne fruit in terms of sustainable outcomes. Now it appears that the tide has turned and that past investment was beginning to pay off. New, viable industries are beginning to be established and are returning substantial economic and social benefits. At a regional level, the definition of a regional aquaculture strategy based on the activities of a triumvirate of SPC/USP/ICLARM provided a useful focus for development.

ACIAR was looking for ways to supplement and enhance the regional programme to be funded by AusAID. Two areas of current ACIAR research focus are trochus and black pearls. This workshop provided a valuable opportunity to get feedback on these activities and through information exchange to place the results of ACIAR research in a proper regional perspective. In so doing, this gives ideas and input into the decision making process for the future funding of research in the SPC region, particularly in relation to these two commodities.

SPC. The draft agenda was tabled and is appended. It was explained that the outcomes of the aquaculture workshop could be linked with the aquaculture session during the Heads of Fisheries meeting.

Session A Trochus Stock Enhancement

Session Chairman **Dr Chan Lee** provided brief introductory comments, agreeing with the previous comments made by Mr Barney Smith.

Item 1. Summary of trochus restocking projects in the Pacific Islands.

The following country observations were provided by SPC member countries:

Vanuatu. Trochus culture in Vanuatu was primarily seen as a community based, people oriented activity. In Vanuatu past experience suggested that for successful trochus programs to occur, up to 60-70% of the time must be spent talking to the communities and raising awareness. In Vanuatu the resources are owned by the people and the government plays a facilitative role.

Trochus aquaculture probably began with the activities of French volunteers from ORSTOM which were then picked up by FAO in 1987. From the outset, Vanuatu saw trochus production as an important source of income for rural people and source of nutrition and protein. 5-6 button blank factories were in operation at the time (1980's) and demand led to an unsustainable level of harvest and trochus management and restocking was set as a priority for the Vanuatu Fisheries Department.

In 1995 ACIAR instigated a project to assist Vanuatu with the development of trochus and had provided funding for restocking programs in Aniwa and Tanna. Two methods of restocking had been attempted; intermediate culture using the large scale stocking of small (1 – 4 mm) hatchery produced juveniles held in tanks and cages until about 40 mm and released onto the reef. The second method was the brood stock translocation/enhancement in depleted reefs.

In summary trochus restocking in Vanuatu provides for the relief of wild stocks and results in both direct community benefits at a village level, as well as capacity building for Fisheries Department staff (research officers).

Tonga. Has had an interest in trochus for quite some time with initial introductions from Fiji in 1994 and 1996 at four release sites. From 1998-2000 further trans-locations within the islands of Tonga occurred. Since this time the Ministry has been producing its own trochus juveniles, both for stock enhancement and as a means of controlling weed in giant clam and green snail culture tanks.

A number of releases occurred in between 1998 and 2000 and there has been good evidence of new recruitment in Vava'u, with enhancement occurring up to 30 kms from the release site. Surveys of release sites up to 2001 have showed good results and the basic objective of demonstrating stock enhancement in Tonga has been achieved.

There is some concern at the relative inability to extend the results of experimental practices in a way that has real impact in terms of benefits to the local population. In summary, Tonga wishes to focus future trochus stock enhancement work on achieving tangible economic benefits and a source of protein for rural communities

Chairman. The Chair agreed that that there was a need for the future regional aquaculture programmes to focus on practical outcomes and that there had already been sufficient basic research in many areas of trochus enhancement. The region now needed sensible recommendations to enable the process to move forward

French Polynesia. Trochus was first transplanted from Vanuatu in 1957 and harvesting began in 1971. No stock enhancement has taken place but trans-location among islands of adult brood stocks has occurred in the past.

The trochus fishery in French Polynesia is worth around 35 million CFP per annum. Currently, the fisheries department regulates the trochus harvest with around 10% of the standing stock being harvested per annum at three atolls only.

Trochus stocks exist in around half of the other lagoons of French Polynesia but are not commercially exploited due to over harvesting having occurred from population pressures, or are under exploited due to strict local laws prohibiting their take.

In some islands, trochus is not a preferred food species and giant clams are preferred.

The prime focus of future trochus development in French Polynesia will be to estimate the carrying capacity of lagoons and understand the extent of trochus stocks, to make sure that future yields will be sustainable.

Palau. Is having some difficulties in balancing the costs of production of trochus with benefits of stock enhancement. It is currently undertaking a cost-benefit analysis of the fishery to assess how to increase economic benefits.

Hatchery costs have increased substantially and are now running at around US\$3,000-5,000 per month.

Small-scale production is continuing but other approaches are under consideration.

In terms of the management of trochus, Palau is looking at identifying sanctuaries and imposing moratoria on catches, since it has been proven that such closures work in terms of benefits for community.

Kiribati. Trochus were originally introduced into Kiribati from Fiji. Two-thirds of the original batch was released on an outer island reef following a one-month quarantine

period. The remaining one-third was kept in the Government hatchery and has successfully spawned and the results of that spawning were released around Tarawa.

It has proven difficult to check survival of animals due to their being hard to find on the reef

The overall aim of trochus introduction was to diversify income opportunities for islands with limited or no lagoon systems or other areas where income opportunities are limited. Kiribati will continue to work on trochus restocking and will continue to subsidise this activity from local funding sources.

Cook Islands. Trochus was first introduced in the Cook Islands (Aitutaki) in 1957, with the first harvest occurring in 1980. Since then annual or biannual harvests of trochus of around 200,000 animals (18-20 tonnes) have occurred on Aitutaki and this represents an important fishery for the island.

Trochus management on Aitutaki is well developed and is carried out under the direction of the island council.

In the 1980's Trochus were transplanted to most islands in the Cooks group and in 1988 some animals were provided to Tokelau under UNDP assistance. Recent surveys have shown that trochus has become well established on some islands while on others less so.

On the capital island of Rarotonga the first commercial harvest of trochus occurred in the year 2001 with 15 tonnes of dry weight shell with a value of NZ\$150 thousand being harvested. Trochus has been difficult to manage on Rarotonga, since the three Districts have differing views on management and wish to operate on their own systems, a management plan is under development

With the assistance of the FAO project, all southern islands have now been seeded with trochus. Trochus restocking will be an ongoing project in Cook Islands and will continue to be sponsored from internal budgets.

Fiji. Trochus has been a major fishery and industry in Fiji, with three button blank factories requiring 240 tonnes of trochus per annum. Trochus production is based on collecting from wild, but a hatchery has been established for quite a few years.

Production of trochus seedlings from the hatchery has been placed in one marine reserve area. In recent times, staff of the Fisheries training unit has gone around communities to discuss giving some of reef over to trochus production.

Care has been taken to take full account of the marine tenure system so as to avoid undermining the rights of indigenous people.

Samoa. Generally there has been few dedicated efforts to develop a trochus industry. Trochus introduced from Vanuatu and Fiji (mid 1990's) and Tonga (two years ago). Trochus enhancement has been undertaken in support of community fisheries management initiatives. To date, there has been no assessment of the success of the enhancement

Niue. Trochus have been introduced in the past under UNDP funding from Fiji and Tonga. 400 animals were released to four sites but to date Fisheries staff have not been able to find any evidence of recruitment as a result of released trochus.

Chairman. In summing up the Chairman noted that there is a common focus on community based management practices running through a number of countries involved in trochus enhancement work. In addition, the Chairman noted that Tonga and others had emphasised that the region should be looking for practical outcomes that will deliver economic benefits to rural people. Research and development in trochus should contain a 'big D' and a 'small R'.

Item 2. Results of ACIAR funded trochus projects in the Indo Pacific.

Dr Steve Purcell delivered a presentation titled "*Outcomes of research on trochus restocking in Australia, Vanuatu and Indonesia: An ACIAR funded project*". The aim of the trochus project was to use field-based research to test the results of trochus restocking in three countries using 3 different country specific approaches; broodstock translocations; mass seeding; intermediate culture.

The project was able to successfully trans-locate broodstock on two islands in Vanuatu, resulting in new populations. Releases of sub-adults were successful for promoting trochus to mature size on the reef. Broodstock translocations were not successful in Australia. Seeding of 1-4 mm juveniles yielded a statistically significant result in Australia, but enhancement was modest and survival needs to be improved. Sea cages were successful for culturing trochus to sub-adult size for restocking in Vanuatu. A new cage design trialed in Australia proved to be optimal. Whilst raceways were successful for culturing trochus to sub-adult size in Indonesia.

Chairman. Two comments; Australian site is interesting and challenging - tidal range is 11 metres and 1 km of foreshore at low tide. Narrow time window to do research due to speed of incoming tide. Also, sharks and crocodiles!

Hatchery is based in one of the Aboriginal communities – trained, then handed over hatchery to local people. In all three counties, successful hatchery work was done.

Questions from countries;

Palau. Some problems have been encountered with tagging juveniles and identification of post release. It has been found to be hard to identify hatchery-reared trochus from wild stocks, especially with small animals.

Response. 1-4 mm trochus are too small for tagging. The ACIAR projects have relied on using surveys of control sites to compare with surveys of seeded sites to check for the effects of enhancement. For larger animals, tagging using thin plastic (Dymo-tape type) number tags glued to shells (with Epiglue) has been generally successful.

Palau. Glue has been tried for sub-adults, but a number of tags have been lost. As an alternative, drilling trochus attachment tags has been tried using a special tool, which has proven very effective.

Response. Agree that the effectiveness of glues does vary. In Australia there were some experiments with stainless steel rivets. The nacre did not effectively seal the hole. Prefer Dynotape and Epiglue as used in Vanuatu, this combination was very successful and achieved very low rates of tag loss.

Kiribati. The reef cages used for growout are interesting – was there any inference from the community in terms of tampering or stealing?

Response. It is important to do extensive background work with community communications as was done in Vanuatu. The importance of the project and benefits to community should be clearly explained. Local people were also engaged to keep an eye on the cages in some locations but in most cases good communications with communities were relied upon and were successful.

Chairman. The Chairman reinforced the comments made by Vanuatu and particularly the need for thorough community consultation regarding the enhancement of reef based resources including trochus. Experience has shown that when adequate effort is applied to communicate with communities the results of stock enhancement are successful.

Papua New Guinea. How did the trochus growth rate results from the project compare with Indonesia? Was there a general relationship between trochus growth rates and the latitudes of which the project operated?

Response. In general, growth rates were lower at the Australian location. Therefore it would appear that growth rates increase closer to the latitudes of the equator.

Papua New Guinea. Trochus fisheries in Papua New Guinea are based on harvesting from wild stocks and no enhancement has taken place to date. Management plans are in place (by restricting numbers of exporters) and one button blank factory is in operation.

Strong agreement with local participation being essential due to community ownership of reef resources.

Chairman. The Chairman noted the value of applying appropriate management regimes to place trochus stocks on a sustainable utilisation basis. Without such arrangements, there is little point in stock enhancement.

New Caledonia. Was an assessment of the cost effectiveness of each of the three methods of stock assessment methods carried out?

Response. Most of the research was done at a scale where cost benefit analysis of the results was not appropriate. Where seeding is done at higher levels, the results are likely to be of greater significance.

Chairman. In the previous phase of the ACIAR Trochus research project, it was established that the cost of 1-4 mm shells was estimated at A\$0.07 per shell and up to A\$0.50 for 40 mm animals. This represents a substantial difference in cost of producing different sized juveniles for restocking (ACIAR Proceedings No 79¹ has a paper which provides more information on the comparative costs of raising juveniles). In the West Kimberly region the indigenous community is in the process of completing a big multi-species hatchery with the capacity to produce up to 12 million juveniles per annum.

Fiji. The Fiji experience has shown the need to look at the commercial potential of potential aquaculture species. Currently, the trochus button blank factories in Fiji are having problems with marketing their product due to competition with synthetic products. The button markets of five years ago are simply not there now.

For some years, the Fijian natural resource sector has focussed on the production of commodities with a long-term commercial potential. This has resulted in the Government Commodity Development Framework (CDF) programme that contributed significantly to developing viable aquaculture in the country. Trochus as a commodity has fallen substantially in terms of price and there is therefore reduced commercial potential. We need to consider this fact carefully before applying more money or resources on research into trochus enhancement.

Tonga. The commercial potential of products to be developed by aquaculture/stock enhancement was an important issue. There was a need to focus efforts and increasingly scarce resources on species that have both food value and economic potential. Of particular significance was the need to use such initiatives to supplement the livelihoods of small isolated island communities.

¹ Document titled "Trochus: Status, Hatchery Practice and Nutrition"

Chairman. Agreed, in the West Kimberly region of Australia many of the previous issues have been raised by indigenous communities, although prices for trochus have been fairly stable. Trochus has been the only indigenous fishery with a demonstrated history in job creation. A great deal of time has been spent consulting with each community to work out what was the species with the greatest potential, often each community had their own favourite species and projects.

The Western Australian Fisheries Department is implementing a training and education programme to help communities develop a more commercial approach and this now 4-5 years down the track. A multi-species hatchery is under development with a capability to raise different species including *P. monodon* post larvae for sale to the commercial sector.

Often it is easy for workshops such as this to agree on economic objectives but we need to make sure that this is what the artisanal sector wants. In most cases, there is a need to seek country and community - specific outcomes.

Vanuatu. There is no one solution as to the best methodology for the stock enhancement of trochus. In Vanuatu, it has been decided to focus on the needs of rural people. Other countries may decide to use trochus to address commercial needs and the fishery can provide a significant source of revenue. In Vanuatu's experience the demand for trochus is so huge that commercial interests are looking at importing shell from the Solomons for the manufacture of button blanks in Vanuatu.

Chairman. In the Kimberly region of Australia indigenous people use the trochus fishery as a "bank" in terms of harvesting the shells as a way to produce cash income to pay school fees etc when needed.

Item 3. Future direction of trochus restocking projects in the Indo Pacific

Dr Steve Purcell delivered a presentation titled "*Future Directions for Restoring Trochus Fisheries in the Indo-Pacific*". The report centred on the outcomes of a workshop held in Vanuatu in May 2001 which examined the future directions of the ACIAR trochus research project.

It was concluded that the results of the ACIAR project can now advance to a broad-scale, developmental project to restore trochus fisheries in the Pacific. Seeding of small juveniles and intermediate culture in cages can be used in certain cases. Also the broodstock trans-locations within regions appears the most effective method for establishing breeding populations on depleted reefs. In addition, programs of community-based management need to be established concurrent to restocking activities to ensure sustainability of trochus fisheries.

Following the presentation of the Vanuatu workshop the Chairman circulated a copy of the Concept Proposal for trochus entitled “*Integration of brood stock replenishment with community-based management to restore trochus fisheries*”. This proposal aims to restore breeding populations of trochus on depleted reefs in the Pacific and establish community-based management practices to preserve the broodstock and foster sustainable trochus fisheries.

Chairman. The Chairman underlined the need to see that outputs from aquaculture projects were translated into sound outcomes. In the West Kimberly a project funded by ATSIC is being finalised that will see agreements made with 17 communities who will all be issued with trochus enhancement licences. Communities will be encouraged to stock with broodstock and the project will also be releasing 12 million juveniles into the 17 farm licenses. It is anticipated that this activity will restore the fishery. An integral part of the project will be the implementation of management strategies that will allow good management across the Kimberley.

Now, comments invited on project concept.

Questions from countries:

SPC. How will ACIAR trochus enhancement project consider the ecological impacts on other related species as a result of translocation and also in the future as trochus become more established at the seeding sites?

Chairman. The impacts of trans-location on native species and genetic diversity are now a major issue throughout the world. In the case of trochus, it has been translocated for many years since post WW2 with a reduced number of trans-locations in the last decade, including those to Kiribati, Palau, FSM, Samoa and Niue.

Tonga. Believed that trans-location is going to be a growing issue and in the case of Tonga, will be catered for in the soon to be completed Aquaculture Act. Research and developments in aquaculture, both nationally and regionally, should include due consideration of trans-location and other environmental impacts. Attention should also be given to quarantine protocols.

ACIAR. Agreed with Tonga and made reference to former protocols for the translocation of marine species across the region developed for giant clams. These would provide a useful starting point on this key issue. As a general rule the problems of trans-location can be substantially reduced by dealing with animals of smaller size to minimise the spread of disease carriage of parasites/other organisms that are more associated with adults and larger animals.

Palau. Noted that trochus had been translocated all over Pacific region to a number of countries. The responsibility of dealing with quarantine and translocation protocols resides with each nation.

Tonga. Tonga could see some links with giant clam and trochus culture, that is, a requirement to be clear with objectives. Giant clam enhancement in Tonga has been successful. But the operation needs to go beyond the research stage and be linked with the private sector and result in improving livelihoods of small communities. Aquaculture research must be firmly based on community needs and economic benefits and this emphasis should be strong at all phases of the proposed project.

Chairman. It is clear that a species such as the trochus is not “everybody’s cup of tea” but is of particular interest to a number of Pacific Island countries. The point is taken that research expenditure should result in returning economic benefits to communities and artisanal fisheries, where such benefits belong.

A good deal of work has been done in the Asia Pacific region without appropriate scientific methodologies, making the outcomes questionable. ACIAR projects attempt to provide sufficient rigour to ensure that results are conclusive and provide clear outcomes, e.g. the broodstock work in Vanuatu.

Based on the concept proposal that was circulated, a proposal was put forward to use broodstock to enhance trochus populations in all countries that choose to be part of the project. Elements of the discussion at this workshop will be included in an update of the proposal, particularly with regard to the need for extensive consultation and ensuring an appropriate level of community benefit. It was noted that any agreements with communities need to incorporate sufficient rigour to get conclusive results and not more questions marks.

The proposed project had two very clear parts; The development of a community-based management scheme that will go hand in hand with the fishery based on the enhanced stock; The application of rigorous methodologies that will be able to generate conclusive results.

The Chairman called for questions

Tonga. Welcomed the proposal noting that it will provide much needed focus. It would help if a paragraph were included to widen objectives that are currently now only community based management. The proposal should include consideration of what will be achieved in terms of economic benefits for nations, both in terms of quantum and timing - such analysis would strengthen the project. Also consideration needs to be given to the effects of basic life history and biology of the species and how they are likely to impact on time scales and benefits. For instance giant clams take a long time to culture and benefits may be slow to be realised. Similarly with pearl culture, the region has gone

down this route primarily because of the success stories of others and yet it is likely that it will be some time before substantive economic results are achieved in some countries.

Response. Growth rates are quite quick in the case of trochus which reach maturity in 2-3 years and may be harvested at 4-5 years and have a longevity of around 12 years. These compare well with other similar species.

Fiji. From the Fijian experience, community based management and aquaculture are two separate issues. It was noted that there is a community based agenda item that is to be considered at the HoF meeting next week and this is appropriate since the project may well need to ask for the assistance of community based programme at SPC. In Fiji, most community-based approaches for aquaculture development have been not successful, other than in a research capacity. Further, no cooperative arrangements in aquaculture have worked. It has been found to be better to deal with individuals rather than communities. In Fiji the CMT (community management training?) are established and working well – it is the management in itself that is not working. There is agreement with the opinion of Dr Bob Johannes that money and economics tend to lead to problems in communities with respect to determining shares. It is import that efforts are made to keep coastal communities intact.

Samoa. Was strongly in support of the community-based approach that should enhance the sustainability of restocked fisheries. Currently the Samoan Fisheries Department is working with 72 villages, preventing reef destruction, establishing reserves, and promoting the importance of the reef. As part of an undertaking to communities, Fisheries Department has been providing clams for communities to put into reserves to help with restocking for past five years. Results are yet to be realised, but communities are very keen and involved in process. With the strong emphasis on community management, Samoa is happy to be involved with the proposed project.

Vanuatu. Was supportive of the concept proposal. In the past, projects have not always included the concept of communities as custodians of resource. Fisheries administration cannot just come up with management measures, like size limits, in isolation. If communities become fully involved, information is provided, and the importance of the project appreciated, then a project is more likely to succeed. Recent success with the trochus fishery was based on community involvement. The same is true with the seaweed project now underway. It is clear that the Government must act as facilitators in such cases.

Response. In terms of community based management it was noted that in Vanuatu that the fishers had been some taking undersized shells. Communities were not sure why management arrangements were in place and did not understand that the 90 mm harvest limit was to allow animals to breed for a couple of years prior to harvest. Once the villagers understood why the limits had been put in place the community were in strong support of the regulation. Therefore part of project concept would involve national co-

ordinators in each country to ensure that restocking activities are not just set up and left. Co-ordinators must make sure that arrangements are regularly reinforced with communities and most tackle the issue of over fishing of restocks resources.

Palau. Expressed support for the proposal, noting that many of the concepts have already been utilised in Palau.

American Samoa. Has just begun a comprehensive community based management project and will be meeting with communities to promote this approach. The media has encouraged interest among communities and this is growing fast. The proposal is strongly supported.

USP. Appreciated the level of community involvement and provided support for the technical/community integration that would occur under the project. It was noted that the framework for community interaction would differ between countries. This matter may be suitable for research, since it is even possible to make distinctions between communities within individual countries. For example, Fiji villages growing seaweed where it was found necessary to consider other economic opportunities in various communities. Social assessments considering such factors would help to decide which communities are most likely to succeed with seaweed. It was suggested that the project go beyond consultation and co-operation and go down the route of researching the socio-economic factors that would influence the likelihood for success.

Forsec. Within SPC we have a community-based project, it was suggested that it would be possible to use trochus as a case study. Further it may be possible to develop a regional project in trochus looking at social and economic benefits across region.

Chairman. Agreed that benefits from the project should go across the region as much as possible but noted that the resources to be made available for the work is likely to be small. Hence there was likely to be a finite budget which would limit the number of countries that could be directly involved. However, it was clear that outcomes from the project could be readily and easily dispersed across the region. The project seeks to get benefits quickly to communities, by going to the next step in terms of delivering concrete economic outcomes to people.

SPC. Noted its potential involvement with the concept proposal as the organisation was in a good position to make the links both within SPC (especially with the Community Fisheries section) and within the region.

Chairman. Summing up, the Chairman concluded that there was great interest and strong support for the project, as well as a stated desire for involvement by a number of countries. The proposal appears to fit well with traditions of island nations.

The next step is to develop and present a project proposal to ACIAR. At this early stage it was not possible to be prescriptive but early indications that a three year project was likely, requiring medium level funding. If everything works out, a new project could be ready for implementation early next year (2002).

Session B. ACIAR Black Pearl Project

Item 1. Status of pearl culture activities in Pacific Island countries.

SPC member countries provided the following country observations.

Cook Islands. In the year 2000 approximately 36 metric tonnes of mother of pearl and 270,000 pearls were produced, worth in the region of NZ\$18 million. The value of production was significantly higher than the NZ\$5 million reported for the previous year, reflecting a more accurate reporting system. 90% of pearl production came from Manihiki. Domestic sales of pearls were worth around NZ\$3.6 million and with NZ\$0.5 million for craft. Pearls were the countries second largest earner of foreign exchange.

It was reported that a few weeks ago problems had occurred with the import of cheaper pearls from overseas for sale in Cook Islands.

The Ministry of Marine Resources has restructured and has a Pearl Development division. It is intended that pearl culture will be extended to other lagoons where potential for pearl culture exists. There is currently one demonstration farm on Rarotonga for tourists.

Fiji. Embarked on a new programme for pearl oyster production about 3 years ago when a commodity based national programme identified black pearls as a product with commercial development potential.

A demonstration farm was established in 1998, with plans to establish 5 farms operating around 30,000 shell in the very near future. In addition there are plans to establish a hatchery to avoid reliance on spat collection.

The program targeted the private sector and in particular the selection of a strategic partner to develop the commercial aspects. At the end of 1998 a private sector farm was set up close to the Government experimental facility at Savusavu and about 1,000 pearls will be harvested after the election later this year. Co-operative development will be undertaken with the strategic partner (one of the major sea-food industry companies, Tailor Seafoods) in the three key phases of production, processing and marketing.

The strategic partner approach has also yielded positive results in seaweed and canned tuna (Levuka cannery) production. Despite recent unrest, the fishing industry is still running strongly, primarily due to the establishment of key strategic partnerships.

Kiribati. The black pearl industry is still at the research stage in Kiribati. A Minister's advisory committee has been formed to advise on pearl development and is functioning. It is planned to move the project outwards from Tarawa to other lagoon islands.

Palau. Some pearl farming occurred in Palau in the 1930's. In the 1970's some pearl oyster research was commenced, but a lack of technology and expertise caused the research to cease. The Fisheries Department was approached by Atlas (a pearl company) and discussions were initiated on the transfer of operations from Indonesia to Palau. Due to potential translocation problems, the decision was taken not to proceed. Recently, the President has instructed Fisheries Department to initiate dialogue with Japan on pearl farming and this has occurred. Discussions have taken place with a company in Japan to initiate a process to establish pearl farming in Palau.

Papua New Guinea. There is currently only one operating pearl farm in PNG at Samurai, based on wild spat collection. Previous attempts to establish pearl farms in this area were not successful. There has been some collection of oysters from the wild in the Torres Strait and consideration has been given to moving some of these pearl shells across to Samurai, but still translocation issues are still of concern.

Tonga. Pearl farming has a long history in Tonga, starting in 1975 with a Japanese company invited to Tonga to look at prospects. This company introduced a number of species, including *Pictada maxima*, and *P. penguin*. The project failed to meet its full potential since the Japanese company wished to secure restricted (sole) rights to waters in Vava'u and the Tongan Government refused this application.

P. penguin actually did very well in Vava'u and growth rates have exceeded those of Japan. Efforts to date have concentrated on the seeding (with mabe pearls) and culture of *P. penguin*, with overseas funding assistance (FAO).

A recent review of fisheries concluded that a viable pearl industry was not going to be established by government's efforts alone. Dialogue was commenced with communities in Vava'u and a pearl industry association was established. Following the success of black pearl culture in French Polynesia and Cook Islands it was decided to go for black pearl culture in Tonga. Black-lip pearl oyster brood stocks are not plentiful and a recent ACIAR project attempted undertook trials to examine the potential for spat collection from the wild. It was found that this form of collection is not viable and the end result is that there is likely to be more attention focused on a hatchery-based black pearl industry. Tonga noted that attention is also returning to *P. penguin* for pearl culture.

Consideration is being given to the appointment of a technical adviser to help support the Pearl Farmers Association's efforts. Simultaneously, a private sector venture has been working on black pearls based on the collection and transfer of adult shell to Vava'u, where they have been "seeded"². Extensive problems have occurred with mortality of pearl shell both as a result of movement and post seeding complications. There is no shortage of enthusiasm for the development of a pearl industry in Vava'u and it is likely that a hatchery in Vava'u will be required if a black pearl culture is to be successful.

French Polynesia. In a recent statement, the Minister of Pearl Culture outlined three goals for the future Black Pearl industry in French Polynesia. These are to; ensure a consistent quality of black pearls reaching the market place (the current pearl quality chart is to be revised and standards set for thickness of nacre); Strict and efficient customs control to prevent inferior production going out of the country and Controls on limiting production to maintain quality.

Item 2. Outcomes of ACIAR funded black pearl projects.

Mr Jamie Whitford provided a presentation of the results of the "*Pearl oyster research development in the Pacific Islands FIS/97/31*" focussing on research conducted in the Kiribati.

In Kiribati the project achieved significant progress in developing low-tech hatchery systems. For example construction costs of the hatchery was A\$70,000 with running costs of A\$50,000. Larval production at day 36 was 3-4 million animals. The cost-effective means for nursery culture of juveniles were investigated. The project established up to 60 000 pearl oysters

Mr Idris Lane provided a presentation titled "*Development of Small Scale Village Farms for Blacklip Pearl Oysters in Solomon*" outlining the outputs of ICLARM's research activities. The objectives of the research project were to find locations for collection of wild spat and assess whether there was enough spat to justify spat collection using artificial collectors. In addition, to determine the best time of year to undertake collection and how to grow the spat effectively and maintain a high survival rate.

The project was able to locate a viable number of spat which were grown to a seedable size. The project managed a demonstration pearl farm and completed two harvests and three seedings. The harvested pearls were sold.

Dr Paul Southgate provided an overview of the ACIAR project "*Pearl oyster research development in the Pacific Islands FIS/97/31*" and discussed a second phase of the project. At Kiribati the major outcomes included the following; routine low-costs

² "Seeding" refers to the surgical process of inserting a nuclei and tissue graft into the host oyster, which becomes the basis of a cultured pearl.

hatchery production; development of nursery culture methods; considerable development of a skills base; the establishment of a “pilot” pearl farm at Abaiang; about 15,000 oysters of seeding size were raised. At Fiji, the artificial collection of wild spat was assessed at 10 sites at Vanua Levu. Up to 10 spat per collector occurred at the best sites and the growth rates of juveniles were excellent. This activity generated commercial interest. A manual for pearl culture was produced.

A review of the project recommended an extension of the project. The major objectives of the project would be to; advance pearl culture in Kiribati to a point where commercial pearl production can begin; facilitate development of a pearl culture industry in Tonga through hatchery production of spat; revise the pearl culture manual from FIS/97/31.

Dr Ian Cartwright provided the presentation titled “*Black Pearl Culture in the Pacific: Past progress and Future Directions. Notes from an ACIAR funded round table discussion held at SPC Noumea, August 2000*”. The presentation was a comprehensive review of the issues affecting pearl culture including; factors to be considered in establishing an industry; spat collection; hatchery technology; training and extension services; marketing; seeding; development options.

It concluded with assessing future research and development needs identifying the need for economic models to ensure economies of scale for family scale farms, maintaining a high quality of production, conditioning broodstock and the need for the region to develop a marketing strategy.

Tonga. ACIAR project has focussed on several areas of major interest to island countries particular with respect to simple, low cost approaches that reduce the funds required to get started. This enables people with minimal resources to get involved. If small levels of production can be made profitable and communities may earn T\$10,000 from such an operation then this would be a significant contribution.

Samoa. In noting some of issues with oversupply and marketing does Black Pearl culture provide real economic opportunities for small Pacific Islands?

Response. The issue is related to costs, income and quality. The Pacific has begun to develop some very cost-effective means of production in terms of hatchery, nursery and grow-out. Provided quality is achieved, there is no reason why a reasonable return cannot be achieved. While the level of these returns may no be large in terms of large commercial companies, a few thousand dollars of cash income can bring very real benefits to small communities.

Item 1. Introduction to SPC Aquaculture Programme development

The session was introduced by **Dr Tim Adams** who provided a brief background to the regional aquaculture initiative. This goes back before he took over as Director of the Division and arose when it was realised that the FAO funded project under the direction of Tanaka-san would come to an end. At this time, the HoF meeting requested SPC to seek donor funding to try to pick-up the pieces and continue regional assistance seamlessly. Around 1996 Mr Julian Dashwood (SPC), Dr Johann Bell (ICLARM) and Dr Robin South (USP) drew up a concept proposal for a follow up regional aquaculture project. The proposal was promoted by SPC to a range of potential funding agencies, for instance, SPC visited the Japanese Embassy, talked to the European Union about the possibility of including it in the 8th EDF and raised it during the regular high level consultations with New Zealand, Australia and France.

It soon became apparent that the initiative was not going anywhere. Everyone cited that so much of the investment in aquaculture in the past had not resulted in commercial success stories and there was a general feeling that funding a regional aquaculture initiative may be seen as throwing good money after bad. It was clear that this perception had to be addressed and SPC had to rehabilitate the name of aquaculture. It proved to be a fairly long job.

It was decided to cut the initial proposal back to first principles and at Vanuatu FFC in 1988, Heads of Fisheries were asked for ideas and feedback to a document entitled 'Regional Aquaculture Strategy'. It was essential a general framework to identify who the main players may be to develop aquaculture in the region. The main aim of this strategy was not to undertake directly aquaculture development as such, but recognise the drivers of aquaculture was considerable private sector investments in a few countries and considerable government investments in others. The idea was to try and provide some regional support to these initiatives and put development on the right track.

There was considerable feedback at the Vanuatu meeting and discussion of the strategy was also taken to the 1998 mini HoF, the 1st Heads of Fisheries and SPC talked to other CROP Agencies of the Marine Sector Working Group to see how they might fit into the overall thrust. The latter gave consideration to how other agencies may fit into the regional strategy, for example, including SPREP with its environmental mandate to assist in addressing environmental impacts; USP with its education and training programs; ICLARM with its applied research; Forum Secretariat with its economic and policy forming mandate.

The key role for SPC was to act as lynchpin for a focus on aquaculture development in the region. Not as the boss but as the central point to put it all together.

The Secretariat kept plugging away, finding it difficult to attract sources of direct funding. In the meantime, it was clear that USP was trying to establish its own capacity and was making substantial progress; ICLARM were carrying out their own research; ACIAR were continuing to operate in a number of member countries.

At the AusAID High Level Consultations in Australia in 1999 the SPC was asked to take the project concept further. Funding for the development of a more detailed proposal was secured and Mr Ben Ponia was appointed to undertake that task. SPC is now on the verge of establishing a fairly substantial regional aquaculture activity.

Item 2. SPC-AusAID Regional Aquaculture Programme.

Following the introduction, **Mr Ben Ponia** presented the “*SPC Regional Aquaculture Program*”. The presentation analysed the current aquaculture situation in the Pacific. It identified the need to co-ordinate the activities among agencies in the region and identified that there were many partnerships that could be adopted. It was concluded that the SPC aquaculture programme could best serve the region by providing a service as the regional focal point and also directly through technical assistance. These needs were to be delivered through the proposed SPC-AusAID project. The 4 major components of the project include; Networking and strategy development; Provision of information services; Training; Technical assistance and applied research. The scale of the project was A\$1.5 million over a three year period.

Fiji. Found the proposal exciting particularly from a country with aquaculture becoming of prominence. But queried why his office had recently received a request for aquaculture information from FAO-SAPA when he was under the impression that the FAO project under Tanaka-san had been terminated.

Response. FAO responded that they were continually updating country aquaculture profiles and were reviewing profiles collected by Tanaka-san which were already two years old. It was made clear that the FAO wished to avoid duplication.

Tonga. Had been waiting sometime for this initiative to happen and noted that the matter had been discussed over many years. Expressed some concern that given the lack of donor interest in this (aquaculture) problem that the scope of the project will only occur within the scope of the donor’s generosity. Within the context of the Tongan Marine Resources Division, aquaculture is severely under funded although it tries it’s best with the resources it has. Unless adequate funding is found for this regional programme at SPC there is a danger that the effectiveness could be compromised and will add to current problems. It was noted that the Pacific islands are littered with unfinished aquaculture projects and there has been much dabbling in this area.

When considering all the agencies that are going to be involved a sense of panic creeps in. Although regional co-ordination is talked about it is sometimes not justified when you consider how individual organisations actually operate in-country. Agencies such as SPREP certainly has links to fisheries, but the danger is that if it starts training and gaining interest in fisheries it will actually adds to national problems and dilute resources and focus.

There is a need to be bolder within the current project proposal. Yesterday's results highlighted two important success stories. In both cases the species concerned were identified as being important to region and an appropriate level of resources were put in. These resources represented more than cash, and included the application of intellectual/scientific/educational resources in a highly focussed way. For example a University puts all of its knowledge in pearls and makes it available to the region.

The end result of these initiatives is that those who wish to take an interest will have a depth of information with which to go forward. That is, the results of previous research and development can be used to arrive at where others are now, for less financial cost.

It was felt that what SPC were putting over to ICLARM was one of the main responsibilities of SPC. That is, let Tonga look at what it must focus on in terms of products that are likely to succeed. Some may discourage farming prawns but it has become a successful commodity for trade. Should not concern ourselves too much with the side issues that drive aquaculture. The project should look at priorities and make the focus of the project and the role of SPC stronger.

In Tonga, aquaculture is taken serious to the extent that the whole fisheries legislation has been re-written into two acts, a Fisheries Act and an Aquaculture Act and both stand separately and equally.

At this stage the SPC project design was a tidy one but perhaps self-effacing, hopefully there would be further opportunities to continue developing the focus of the program. SPC should be more than just a focal point and it should play a stronger role and must drive initiatives forward.

Response. It was noted that Tonga had closely mirrored the thoughts of SPC. SPC was glad that it was recognised that the organisation had to start somewhere and it was a major task to even getting the first step on the bottom of the aquaculture development ladder. But it was expected that the ladder would reach fairly high in the future. At the SPC 50th Anniversary Conference in 1997 the SPC divisional heads were asked to think about the vision for the next 50 years and it became obvious that in the marine resources field one major change was going to be in the aquaculture field. This is what encouraged the organisation to keep trying to progress with its aquaculture programme.

SPC recognised that the need to clearly identify workable solutions and to apply a concentrated effort in these commodities had been highlighted by previous speakers. This would be taken onboard one of the first activities of the project would be to identify what is considered by the region to be those workable systems and where the project should concentrate more effort on.

Fiji. Has always been supportive of a regional aquaculture programme within SPC. Fiji understands quite clearly that aquaculture could be filling the gap in the demand for fisheries products and was one of the important management tools to provide relief for capture fisheries. In addition, the provision of sources of protein for the people will be important.

Aquaculture provides one of the best options for peoples of outlying islands and some considerable recent success has been achieved with seaweed culture. The furthest island from Suva had been doing seaweed farming and in the last 5 months they earned F\$76,000 from seaweed. This amount of money doesn't happen often and was the result of aquaculture.

Fiji agreed with Tonga that there is a need for the initiative to move forward in a more forceful way. Fiji agreed with the proposed network programme as it was presented but noted that it appears to be somewhat broad in the areas it seeks to cover. Fiji has entered into the specific network program area – genetics and this has provided benefits through improving the stock, it provides an example of focus. The regional project may need to move this way and adopt a similar focus. Each country in the region is different and could network for their own purposes, those interested in genetics could have their own network, those interested in pearls to network and etc.

On the matter of applied research, clarification was requested on what kind of applied research would ICLARM be doing versus the nature of in-country research. Fiji has worked with ACIAR on in-country applied research leading to capacity building, for example one of the diploma staff was now progressing onto a PhD through the research activities. There is a need to make sure that benefits from ICLARM research will flow to all on a national basis. Fiji is also very supportive of the library/information aspects of the proposed aquaculture programme.

Response. On the networking this would be discussed later. On the applied research, the project recognises the need for progressing regional research into national outcomes. The SPC also provided an update on recent developments with ICLARM and noted that there would be a closer linkage because ICLARM was establishing two new aquaculture posts in Noumea as well as a regional office, which will facilitate a closer working relationship.

Vanuatu. SPC presentation flagged some of the important issues that countries were trying to deal with in establishing a focal point. When aquaculture was just starting in the region FAO was attempting to find donors, but with little success. And so each country

was left to struggle in its own small corner with whatever limited resources it had. A number of countries duplicated their efforts, it was recalled that in the case of trochus and clams about 70-80% of all SPC countries were doing the same thing. It was important for the regional aquaculture program to go past that phase and avoid replication. It was perhaps better to determine which individual resources are of value to specific countries as had been elaborated on by Tonga and Fiji earlier.

There is a need to make more use of local consultants to facilitate technology transfer and share knowledge within the region rather than placing an over reliance on outside assistance. There was enough expertise within the region and all that was required was the money to activate the sharing of this knowledge. The Vanuatu experience with technical assistance provided from Fiji was a good example of this and Vanuatu benefited greatly. Vanuatu was happy that SPC could act as the focal point and could co-ordinate the use of more locally based consultants as this was probably not being co-ordinated very well at present.

Vanuatu supported the proposed SPC aquaculture programme and hoped that donor would provide the requested funds to support the project.

Lastly it was requested that the programme avoid being just another type of project where experts are sent to countries for several weeks and there is no follow up support to prop up developments.

Item 2. Developing a regional aquaculture development strategy and regional networking.

A presentation was provided by **Ms Natalie Macawaris-Ele** from a paper titled “*The FAO-NACA Bangkok Declaration and Strategy on Aquaculture Development: Framework for the Development of Aquaculture Strategy in the Pacific*”. A description of the key elements of the Bangkok Declaration was made outlining principles of; Investment in aquaculture research and development; Implementing responsible policies; Capacity building; Mechanisms for information exchange; Co-operation among stakeholders. Some issues for consideration in formulating a regional network were raised and it was suggested that some lessons could be learned from the experience of NACA.

NACA. A verbal presentation was provided by a representative from NACA on the organisation and how SPC member countries may derive benefits from either full or associated membership of the Association.

Samoa. Do we have to be a member to NACA to get technical support?

Response. If a country becomes a member of NACA they will have the opportunity to become the main centre in an area of expertise, e.g. pearl oyster and have a responsibility

for providing training and technical assistance to other NACA members. It is the spirit of NACA for countries to be both the recipient and donor of aquaculture information and expertise, although the equation will not always be equal. For instance, Thailand is responsible for a wider range of activities than a number of other NACA members.

Fiji. What is the form of the new FAO involvement in aquaculture?

Response. At the start of a proposed Phase 2 of the FAO regional aquaculture project, donor funding was sought, but no funds were forthcoming. FAO strongly believes there is a need for aquaculture in the region and will help to assist countries with the implementation of the Bangkok declaration. FAO is therefore maintaining an aquaculture presence in the region and will continue to and look for donors. There are currently no specific FAO funded programmes, but if nations have specific requests for aquaculture assistance then FAO-SAPA TCP programme funds may be available.

SPC. Obviously there is a need to make it much clearer what FAO and SPC and others are doing in aquaculture in the region.

FAO. Would like to add that in respect of the SPC aquaculture programme that FAO recognises the expertise that SPC has and its closeness to the area. FAO is spending more time and resources in Africa, Caribbean and South America as priority regions for aquaculture, so funding and staff available for the Pacific is limited. A new sub-committee of COFI is likely to promote more activity in aquaculture world-wide and within the region. The first session of the sub-committee is proposed in April 2002 and will be reviewing all aquaculture activity in the region and prioritising its plans. FAO would like to reiterate its willingness to work closely with SPC and hopefully an MOU between SPC and FAO will materialise very soon. FAO supported the SPC proposal.

Fiji. It was noted that FAO supported NACA for the first 10 years during which time it achieved considerable success. It is to be hoped that a similar level of support will be available for the SPC regional network.

Fiji had considerable experience with NACA and was convinced that the Pacific was different from NACA countries. Further it appeared that that FAO funding was centred on the Asia region and few resources were being allocated to the Pacific region.

It is clear that the Pacific region is different in many ways including physical structures (continents vs. islands) different culture conditions – i.e. stronger currents and flushing in the Pacific, and different species that are targeted. In the past in Fiji attempts to transfer technology and techniques from Asia have not yielded good results. For example experts have been brought from India, Japan, China, Thailand and the Philippines with poor results. Again in referring to an earlier intervention it was restated that the region must push hard for our own, Pacific oriented, programmes to be based here.

SPC. It was clear that SPC had to look closely at the modalities of co-operation between the Pacific region and the Asia region. The normal way to establish working relationships was through MOU's, and as already mentioned SPC and FAO were undertaking this process and this could be later elaborated into a specific agreement when it comes to aquaculture. Also CROP working groups was another useful area to provide enhanced co-ordination and perhaps there was potential for the FAO-SAPA office to take part in some of the discussions. There was also the possibility of a more formal linkage with NACA. SPC needs to explore all the options and discuss them thoroughly with the region before going any further.

Tonga. Keen to know how formal links with NACA can be established either through Tonga joining in its own right or through SPC as a regional membership. Tonga is in no doubt that there are considerable benefits available in learning from experience of Asian aquaculture and that nothing but good will come out of strong links with the NACA organisation.

In terms of the FAO aquaculture post, it may well be better if it had been placed in SPC Noumea rather than in Apia, but it was noted that FAO would have its own policy and procedures in this regard. Tonga noted that it had approached FAO on a couple of recent occasions (with respect to pearls and seaweed) but it seemed that FAO did not have the ability to help with tangible assistance. Tonga was not berating FAO but it is to be hoped that once the new FAO officer is settled in Apia that something will happen. It can be a time consuming effort to get assistance. It is to be hoped that the FAO office will look at assisting with real problems and issues in aquaculture rather than focusing on generalities within COFI agendas and outcomes. Perhaps before the meeting concluded it could find some understanding on how SPC could formalise its links with NACA.

Vanuatu. If we are to have a regional aquaculture programme, then we should manage it properly. We have heard from other regional activities and there has to be a network to avoid duplications and reinvent the wheel. Given there were few donors in the region a network was essential to share the limited resources that it had. Regional networking had the added benefits of learning from other experiences and for example fine-tuning the Asia systems.

There was agreement with Fiji and Tonga that projects should be economically sustainable (low cost, low technology and low maintenance) so that they would be viable for the long term. Seaweed farming provided a good example of a low technology initiative. It was suggested that linkages be made with SPC Training Section and that some funds could be set aside for aquaculture training. In Vanuatu a serious seaweed farming development had arisen from training assistance provided by the Fiji expert (for which it thanked Fiji) and it did not cost a lot of money, only required a ten-week programme and now it was booming and government was fully behind its long term development. SPC was requested to focus on commodities such as seaweed which are low cost, low technology and able to be easily maintained.

SPC. What Vanuatu had described was exactly the kind of assistance that SPC hoped to provide the region and there has been considerable amount of discussion that had gone into the design of the SPC project. At this stage the aim is to try and get a network going in the Pacific region and then there will be something for the Asia region to link to. Obviously the region would like to take advantage of what had been developed in Asia, in terms of expertise etc and this region could have something to offer in return. It was suggested that defining precisely the linkage with NACA was not the priority of the workshop but it would be one of the priority issues to take from the workshop.

Tonga. Stated that the issue was not one of seeking approval for the proposed project. It was more a question of whether we want aquaculture to succeed and what we need to do to achieve a desired development. The countries supported the new aquaculture initiative and should then push to achieve this. In this way we become our own drivers and are not donor driven. If one donor does not accept this approach then perhaps another will, if we are not successful at all we may have to find resources on our own. The best option remains to decide here what we want and then seek donor assistance to achieve this.

Forsec. The Forsec would support efforts to improve co-ordination of efforts within the region because of the very reason of scarce money, resources and problems of duplication.

Understood from discussions that FAO was creating their own initiative on aquaculture. If aquaculture is a priority then the Forsec is happy to champion the cause with other donors. It is a matter of concern that the Forum has endorse the FAO food security programme and that any new initiative will essentially be dipping into the same pool of money available for the region. Forsec would want FAO to work with SPC and integrate initiatives, to avoid duplication.

FAO. For clarification, the FAO will not be putting up their own regional strategy and in keeping with the Bangkok Declaration will be happy to work with and support SPC. FAO does not intend to establish a separate network or regional strategy from that of the SPC initiative.

SPC. Was intending to elaborate further with another presentation on the need to establish networking among the region or how we might go about setting up a network. However it was obvious from the meeting that this was already accepted and it was a task that SPC was in a suitable position to undertake.

Final Outcomes of the Workshop.

Statements outlining the outcomes of the workshop were drafted and endorsed.

OUTCOMES OF THE SPC-ACIAR AQUACULTURE WORKSHOP

1. The meeting strongly endorsed the decision made by HoFs in 1999 for the establishment of a regional aquaculture programme to be implemented by SPC. It was agreed that the elements of the proposed “SPC-AusAID Aquaculture Project” were consistent with the expectation of SPC member countries. The meeting urged the programme to focus on the cost-effective ways of facilitating activities that support specific national priorities for aquaculture development and that would lead to real benefits among local communities. Amongst these activities would be the promotion of local expertise for inter-country sharing.
2. The meeting recognised that the establishment of an aquaculture network and a regional strategy, in consultation with member countries, were priority tasks for the programme at the regional level. On this basis linkages could then be elaborated between the Pacific Community region and other networks.
3. In terms of regional linkages the meeting urged that SPC as regional focal point for aquaculture should co-ordinate existing expertise amongst the various agencies in the support of appropriate aquaculture development.
4. The meeting reinforced that some aquaculture issues were held in common throughout the region. As such there was a need to identify these regional issues, and build on or operationalise existing regional agreements (such as those on inter-island transfers and quarantine protocols).
5. The meeting gave special attention towards trochus stock enhancement. It strongly endorsed the ACIAR concept proposal “*Integration of broodstock replenishment with community-based management to restore trochus fisheries*” Noting that this was potentially a useful case study, the meeting further suggested that appropriate linkages to the SPC Community Fisheries Section be investigated.
6. Black pearls were also given special attention. The meeting recognised that there continued to be a widespread interest among the region for pearl culture and several islands such as Solomon Islands, Kiribati and Fiji had recently made significant steps towards private sector development. The meeting also noted the recent success of the ACIAR funded project in developing low-cost hatchery and nursery systems which offered potential for some countries such as Tonga. The meeting urged that such technical knowledge be made available for the benefit of the region. It also noted that the future profitability of the industry depended on regional co-operation in maintaining a high quality reputation for Pacific Island black pearls.



Agenda
SPC-ACIAR AQUACULTURE WORKSHOP
20–21 July 2001, Noumea, New Caledonia

Friday 20th July – Day 1.

08:30 hrs - Welcome by **Tim Adams**, SPC Marine Resources Director and **Barney Smith**, ACIAR Fisheries Program Manager

08:40 hrs - Scope and aims of the workshop and adoption of the agenda

SESSION A: Trochus stock enhancement (Chair: **Chan Lee)**

Item 1: Summary of trochus restocking projects in the Indo-Pacific

08:45 hrs - Country experience with trochus restocking activities

Item 2: Result of ACIAR funded trochus projects in the Indo-Pacific

09:30 hrs - Outcomes of research on trochus restocking in Australia, Vanuatu and Indonesia – an ACIAR funded project -- **Steve Purcell** and **Moses Amos**

10:15 hrs - *Morning Break*

Item 3: Future direction of trochus restocking project in the Indo-Pacific

10:45 hrs - Future directions for restoring trochus fisheries in the Indo-Pacific – outcomes from the informal workshop held in Port Vila on 24 May 2001 -- **Moses Amos** and **Steve Purcell**

11:15 hrs - Future opportunities in restocking of Trochus in the Indo-Pacific region – an open forum, including discussion of a concept proposal for a trochus restocking project

12:30 hrs - *Lunch (Light lunch will provided by ACIAR at the conference venue)*

SESSION B: ACIAR Black Pearl Project (Chair: **Ben Ponia**)

- 13:30 hrs - Introduction
- 13:35 hrs - Country experience with pearl oyster culture
- 14:30 hrs - Formal presentation on outputs of ACIAR/ICLARM research -- **Paul Southgate/ Jamie Whitford/ Maruia Kametae/ Idris Lane**
- 15:00 hrs - *Afternoon Break*
- 15:15 hrs - Outcomes of October Workshop – includes key points arising from country presentations -- **Ian Cartwright**
- 15:45 hrs - Marketing/Pearl Quality Issues -- **Rudi Zingg**
- 16:30 hrs - Discussion
- 17:30 hrs - End Day 1



Saturday 21st July – Day 2.

SESSION C: SPC Regional Aquaculture Initiative(Chair: **Tim Adams**)

- 09:00 hrs - Introduction
- 09:15 hrs - SPC-AusAID Aquaculture Project -- **Ben Ponia**
- 10:30 hrs - *Morning Break*
- 10:45 hrs - Regional Aquaculture Development Strategy -- **Natalie Macawaris-Ele**
- 11:15 hrs - Regional aquaculture network -- **Ben Ponia**
- 12:00 hrs - *Lunch*
- 13:00 hrs - Afternoon - Open Session

