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**SPC Recommendations for Regional Collaboration in
Pearl Culture, 2006**

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Background and introduction

1. Cultured pearls are produced from the black-lip pearl oyster (*Pinctada margaritifera*) which is widespread throughout the Pacific but occurs in the greatest natural abundance in the atoll lagoons of eastern Polynesia.
2. A regional pearl meeting, organised by SPC, was held in Nadi, Fiji from 31st November to 2nd December 2005. The objective was to, benchmark the status of pearl production in the Pacific, share information of common interest, and explore areas for technical collaboration. Meeting participants from the Pacific included government, private sector and academia¹.

Status of the pearl culture industry

3. The Pacific has been farming black pearls for over two decades. About 95 percent of pearls come from French Polynesia. The remainder by the Cook Islands, and recently Fiji Islands. Countries such as Marshall Islands, Federated States of Micronesia, Tonga, Papua New Guinea, Solomon Islands and Kiribati are in varying stages of commercialisation. Pearl export peaked at around US\$170 million per annum the late 1990s but overproduction and poor quality lead to a decline of about US\$100 million per million. Present marketing conditions are cautiously optimistic.
4. In 2005, French Polynesia reportedly experienced an upturn in the pearl market. Total annual export was US\$126 million but more importantly the price per gram has increased 20 per cent. In part this reflects positively on government efforts to implement stringent quality control measures, initiated after the slump in the 1990s. It may also reflect the tough economic climate which caused many smaller unprofitable farmers to abandon farming.
5. The Cook Islands has yet to recover to the peak level of production experienced in 2000, prior to the bacterial disease outbreak in Manihiki atoll lagoon. Official export statistics show a decline from NZ\$18 million to NZ\$3 million in 2005. Some measures have been put in place by government and the local Island Council to prevent overstocking of oysters from occurring and monitoring of the environment. However, productivity is still low and the investment climate sluggish.
6. The Fiji Islands is emerging as a potentially significant producer. The largest commercial farm (J. Hunter Pearls Ltd) has been operating successfully for several years. With an abundance of sites for farming the government plan has set a target of a US\$40 million dollar industry within the decade.

¹ Cook Is, Fiji Is, Solomon Is, Kiribati, Marshall Is, Micronesia, Tonga, Papua New Guinea (French Polynesia was not officially represented).

7. Trials in Micronesia are progressing steadily towards opportunities for rural development. Kiribati has had prolific rates of production from its simple hatchery in Tarawa but the government has not been able to capitalize on this result commercially. Elsewhere variable levels of effort both by private sector and government are occurring but consistent or significant results are yet to occur.

Opportunities and constraints

8. Aside from the black lip oyster the Pacific has yet to take advantage of other naturally occurring pearl oyster species. The Solomon Islands and Papua New Guinea has *Pinctada maxima* which produces a luminescent white pearl. The winged oyster (*Pteria penguin*) found in Fiji Islands and Tonga can be cultivated for a half pearl with purple undertones.
9. Where natural stocks of oysters are low the lack of seed supply is a bottleneck constraining the expansion of pearl farming. Whilst on the one hand the technology for breeding pearl oysters is fairly well developed, in reality the amount of customisation, resources and dedication required is often underestimated, particularly at government facilities.
10. Compared to other types of aquaculture (for example marine shrimp) the pearl industry would appear to be falling behind in terms of research and development. Complacency in the Pacific could cause the region to miss out on significant benefits from technology. For example the time for pearl harvest (normally 18 months) might be significantly reduced by using sterilized triploid oysters which grow faster. Another example may be the application of basic genetic manipulation techniques to select oysters which generate valuable coloured pearls.
11. The Pacific's experience with disease outbreaks highlights the need for environmental management to keep pace with the level of farming intensity. The Cook Islands government has adopted a regime which may assist the region establish best practices. This includes regular automated water quality testing from a remotely operated buoy, disease surveillance, digital mapping of farm leases, pearl census database and legislation to regulate farming practices.
12. The pearl grafting operation ("pearl seeding") is the perhaps the most important factor affecting pearl quality and profitability. Therefore investing in programs to raise the standard of pearl seeding technicians might be the most effective means to generate the greatest cost-benefits to industry. As shown in Table 1, a technician with "excellent" skills seeding 1,000 oysters would generate US\$19,000 dollars revenue compared to US\$13,300 for an "average" skill and just US\$8,600 by a "poor" technician. The bottom line is that poorly skilled seeding technicians lead to unprofitable levels of production, even when subverting to a lower fee.

Table 1. Performance measure and profitability for varying level of technician skills (seeding 1,000 pearl oysters and charging a fee of US3 dollars per oyster)².

Parameter	Technician 1 “Excellent”	Technician 2 “Average”	Technician 3 “Poor”
<i>Results at Harvest</i>			
Poor quality, unsaleable pearls (%)	20%	30%	40%
<i>Revenue at Harvest</i>			
Revenue from pearls	US\$19,000	US\$13,300	US\$8,600
Seeding costs as % of revenues	37%	53%	81%

13. The Pacific has economic planning tools such as spreadsheet models which can be used to undertake sensitivity analysis and risk assessment for profitability. This is considered an essential step prior to any farm set up noting the high risk and long term investment which characterises pearl farming. Sensitivity analysis may help industry identify the critical factors (for e.g price per gram) which affect profitability.

Framework for regional cooperation

14. Recommendations for regional cooperation and guidelines for national development were drafted at the Nadi meeting and are appended in Annex I.

Purpose and planned outputs of this session

15. The main intent is to seek acknowledgement and where appropriate endorsement and support of Heads of Fisheries representatives for the recommendations produced by the SPC Regional Pearl Meeting, Nadi, 2006.

16. This framework for cooperation is non-binding and voluntary. They will be accepted as contingent guidelines that may be amended from time to time.

17. Furthermore the deliberations of this session will provide guidance for regional agencies providing assistance to pearl farming, in particular SPC.

Recommendation

18. Representatives to Heads of Fisheries are requested to support in principle the “SPC Recommendations for Regional Collaboration in Pearl Culture, 2006”

² These scenarios were generated by Dr. Haws from the University of Hawaii and presented at the SPC Pearl Meeting, Nadi, December 2005.

SPC Recommendations for Pearl Culture Collaboration, 2006

Policy, Networking and Information

1. *The lack of clear policies in the pearl sector must be addressed.*
 - a. The existing policies should be revisited to amend or create clear policies where needed;
 - b. All stakeholders must be involved in this process.
2. *The lack of regulations and legislation - particularly in the area of water rights, leases and tenure for private sector individuals – must be addressed.*
 - a. Clear regulations and legislation should be put in place.
3. *Policies should incorporate the obligations of a grafting permit required by a seeding technician.*
 - a. Since many seeding technicians are foreigners, such a permit may need to be incorporated into foreign investment policies.
4. *A regional association should be established as a commission for the pearl sector.*
 - a. Its formation could be endorsed through the Pacific Islands Forum Secretariat (PIFS) Heads of Government meeting;
 - b. It should include the main producing countries, e.g. French Polynesia. Assistance could be provided through regional organizations;
 - c. The Pacific regional maritime association (PACMA) may serve as a prototype – SPC serves as the secretariat;
 - d. Regional meetings in the pearl sector are urgently needed.
5. *The lack of information and resources to share information must be addressed.*
 - a. The Secretariat of the Pacific Community (SPC) and other regional bodies should be encouraged to address this shortfall;
 - b. Newsletters, bulletins and websites and etc should be utilized;
 - c. A database may be required;
 - d. If necessary a regional coordinator post should be created and recruited;
 - e. A network for collaboration should be established.

Marketing

6. The SPC should be tasked with gathering and disseminating marketing information to all of its regional member countries - in a timely manner.
 - a. Information sources such as national marketing reports and international newsletters could be utilized;
 - b. The SPC Special Information Pearl Bulletin and the aquaculture portal website, electronic flash message distribution service and etc could be utilized as information clearing house mechanisms.
7. Countries should be encouraged to develop a national marketing strategy.
8. A regional marketing strategy should be developed.
 - a. The regional marketing strategy should take note of the opportunities and constraints for inter-regional “branding” of pearls.

9. A regional association should be formed comprising of national representation for the purpose of marketing (including intelligence, standards and etc).
 - a. The PIFS and SPC should be tasked with the formation and administration of this association;
 - b. The functions of this grouping may be carried out through the regional association suggested for policy directives in recommendation 4.
10. The region should adopt the GIA (Gemological Institute of America) standards as a minimum requirement.

Research and Development

11. The goal of research and development should be oriented towards increased profitability. This equates to improved pearl quality and retention, more efficient culture methods and stock improvement.
 - a. Some of the exiting opportunities for research include genetic selection, triploidy and seeding techniques;
 - b. James Cook University (JCU) of Australia is well placed to deliver upon the research and development programs identified above.
12. Capacity for pearl disease management must be enhanced.
 - a. The SPC should collaborate with other key regional agencies such as SOPAC and SPREP in developing guidelines for best farming practices.
13. There should be efficient communications between the various stakeholders involved in the research and development process.
 - a. SPC could be the vehicle to establish communication and utilize mechanisms such as the SPC pearl bulletin and aquaculture portal website to achieve this.
14. There should be special emphasis placed on the monitoring and evaluation of seeding technicians.
 - a. Critical control points such as that employed by the United States HACCAP standards may be employed as a checklist and minimum standards for technicians and farmers to adhere by;
 - b. Where comparisons may be useful the countries with the region should be encouraged to share data on the seeding success/failure rates of their technicians;
 - c. A standard reporting sheet could be developed which countries may adopt towards a common database. There needs to be confidence built within countries and industry on how sensitive seeding information will be handled;
 - d. A regional or national “grafting inspector” may be required within the profession.

Infrastructure

15. The critical and urgent area that needs to be addressed for infrastructure lie in developing hatcheries and spat collection to ensure consistent supply of spat for farming.

Training

16. Training in oyster biology, hatchery culture is a key priority need for the region that must be addressed.
 - a. JCU and the University of Hawaii at a Hilo (UHH) are training institutions within the region. JCU has run courses in this area in the past funded by the Australian Center for International Agricultural Research (ACIAR);
 - b. The ACIAR is a potential funding agency within the region;
 - c. The concept for an oyster biology, hatchery training program may include the following:
 - 2 courses run per year over a 3 year period;
 - 6 week duration covering: longline/equipment deployment; micro algae culture; spawning induction; hatchery culture; larval, nursery culture and grow out;
 - Once the course has been fine-tuned and established it should be phased into the region by involving the University of the South Pacific (USP) as a regional training center. This could occur in year 3 or thereabouts.

17. Training efforts should be undertaken to increase the number of qualified successful local seeding technicians amongst the region, particularly in countries with large commercial production.
 - a. However a source of abundant pearl oysters must be found in order for training to take place. This may necessitate a regional training centre where resources can be pooled (e.g. hatchery);
 - b. It is preferable that training be undertaken in-country;
 - c. A travelling trainer may be the most effective way of providing training in seeding techniques to remote and distant areas. A “Master Grafting Technician” may be required within the seeding technician profession.

18. A regional workshop on pearl grading should take place to upskill farmers knowledge in pearl quality and marketing aspects.
 - a. The SPC should be tasked with organizing and seeking funding for such a workshop;
 - b. It may be more effective for a travelling trainer/grader to visit countries.

19. Certification provided by training programs could be utilized as a requirement for those wishing to be granted a permit under a national permitting system (for e.g. French Polynesia).
 - a. This could ensure a minimum level of technical competence within the industry;
 - b. Regional standards could be incorporated into national certification programs.