PARDI Capacity Building in the South Pacific

An ACIAR-funded initiative

Australian Government
Australian Centre for International Agricultural Research

PARDI

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PARDI Background

The Australian Government supports the ongoing development of agricultural industries in the South Pacific region including through the Pacific Agribusiness Research for Development Initiative (PARDI).

PARDI commenced in February 2010, is coordinated by The University of Queensland and funded by the Australian Centre for International Agricultural Research (ACIAR). PARDI seeks to create sustainable livelihood development outcomes for the South Pacific forestry, fisheries and crop-based sectors. Scientists undertake supply-chain and market-driven research to identify constraints that impede local economic development. Research is aimed at achieving tangible solutions, such as new skills for locals, new technologies and product options.

PARDI is a partnership that involves The University of Queensland (UQ) under the Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of the South Pacific, the Secretariat of the Pacific Community, University of Adelaide, James Cook University, The University of the Sunshine Coast, the Queensland Government's Department of Agriculture, Forestry and Fisheries (DAFF) and Southern Cross University.

To find out more about PARDI, go to 'Focus Areas' at the following web site: http://www.spc.int/lrd/

Assoc Prof Steven J.R. Underhill
PARDI project leader (UQ - QAAFI)

"Purposeful and targeted capacity building is not essential, but it is the cornerstone of achieving enduring impact," Assoc Prof Steven J.R. Underhill.

What is capacity building?

Capacity building is an approach to development that focuses on understanding obstacles that inhibit people, governments, international organisations and non-governmental organisations from realising their developmental goals. Once these obstacles are understood, it builds the knowledge, skills and communications of the people in question to help them to achieve measurable and sustainable outcomes. Capacity building in the 21st Century is included in the programs of most international development organisations.

PARDI capacity building benefits

Helping people help themselves

Capacity building under the PARDI project is making inroads towards empowering people in the region to help themselves and achieve stronger economic independence. PARDI research aims to help develop the tools and the capacity for local people to ultimately drive agribusiness expansion.

Our research and development is structured to enable positive partnerships along all of the value chain. A high level of local engagement is practiced so that research design can be attuned to local-level needs alongside bigger-picture issues, such as helping to ensure regional security and working towards a long-term reliable food supply.

Our approach is to give participants a positive stake in real outcomes and long-term capabilities so that research has an enduring impact.

Capacity building strategies employed by PARDI include:

Working directly with the critical value chain champions and key research beneficiaries through targeted and relevant agribusiness, business, and commodity-specific skill development.

Up-skilling the next generation of research, extension and teaching staff to better support future industry.

Promoting agribusiness value chain review methodology to government stakeholders in the Pacific (through-participatory chain analysis).

"Ultimately, our capacity building efforts are aimed at achieving enduring livelihood benefits for the South Pacific which benefits people, food security and business for generations to come."

Personal snapshots from the Pacific

Salesh Kumar

Postharvest studies

"PARDI has an extremely significant contribution towards my research work and recognizes me as a valued member of the participant guarantee system (PGS) research team."

Salesh is undertaking a PhD at the University of South Pacific (USP) co-supervised by Dr Sunsil Kumar (USP) and Prof Steven J.R. Underhill (University of the Sunshine Coast). Salesh's current research supports wider efforts to better connect Fiji farmers to high-value domestic markets. Salesh's PhD program involves a systematic postharvest and economics evaluation of vegetable value chains in Fiji. Salesh has also received intensive postharvest theory and practical training through PARDI funding to attend the 2013 Postharvest short-course at University of California Davis.

Monal Lal

Genetic diversity of cultured black lip pearl oysters

"PARDI has contributed significantly to my work by facilitating my efforts to sample black lip pearl oyster populations across many of the Fiji islands."

Monal is undertaking a Doctor of Philosophy in Aquaculture within the School of Marine and Tropical Biology at James Cook University, Queensland. Monal's research supports wider efforts to boost the South Pacific region's cultured pearl industries. Cultured pearls produced by the black lip pearl oyster are the most valuable aquaculture commodities in the region. To help ensure sustainability, PARDI is funding research to address the management of wild and farmed populations. Monal's research looks at the genetic diversity of wild pearl oyster populations. Understanding the genetic status will enable fishery managers and pearl farmers to manage wild and domesticated oyster resources.

Karishma Kavita Devi

Consumer research: fruit and vegetable consumption patterns

"PARDI has empowered me to advance my knowledge and experiences through capacity building and interaction with many high-level professionals."

Karishma is a scientist from the University of the South Pacific, Fiji. Karishma is working on a PARDI-funded project which seeks to understand the fruit and vegetable consumption patterns of Fijian and Fiji-to-Australia Immigrants and the implications these have for health and food security. Her area of research is in agribusiness management with a focus on household consumption patterns and food security.

The PARDI project is providing Karishma with the opportunity to generate information that will educate local communities and health professionals about food consumption choices and the related health consequences. Overall, this research has the potential to positively influence fruit and vegetable industries in Fiji and Australia.

"PARDI has contributed significantly to my work by facilitating my efforts to sample black lip pearl oyster populations across many of the Fiji islands," Monal Lal.

Our snapshots are a selection of insights from some of the people who experience direct benefits from PARDI. There are many more (not covered in this booklet) who are invovled in some way in research and education that directly benefits their local business communities.

Amit Sukal

Clean seed for market-ready taro

"Because of PARDI funding, I have been able to conduct this important research."

Amit Sukal is employed by the Secretariat of the Pacific Community's Center for Pacific Crops and Trees (CePaCT) as a Plant Virus Diagnostic Officer and is completing his master's degree on "In Vitro Virus Elimination from Taro (Colocasia esculenta) for the Safe International Exchange" through the University of the South Pacific, Fiji. CePaCT is the hub for exchange of plant genetic resources in the Pacific. Amit has the task of ensuring that plant resources are virus tested and cleaned of virus infections. Through PARDI research, Amit is evaluating the utility of heat therapy to help eliminate the widespread *Taro badnavirus*. The work will contribute to developing a clean seed system for market-ready taro varieties in Samoa. Amit's research is likely to result in a protocol to enable taro plant material to be cleaned prior to distribution. This may improve crop productivity and boost agricultural and food security.

"My involvement in PARDI has given me experience in working with a greater range of disciplines," Larren Gomese.

Larren Gomese

New market opportunities for smallholder timber farmers

"My involvement in PARDI has given me experience in working with a greater range of disciplines."

Larren works for ACIAR (in the Solomon Islands) as the in-country coordinator for their agro forestry project. Part of his role involves coordinating the PARDI project "Developing a market mechanism for smallholder timber growers in Western Province". PARDI funding has enabled Larren to carryout value chain analysis, interview farmers, timber merchants and producers to gain an understanding of how the market for smallholder timber may develop. A PARDI-funded harvesting and marketing exercise will see smallholder timber from Western province be sold for export in 2014 for the first time in the region's history.

Joseph Merip

Training cocoa farmers to produce world-class cocoa

"The PARDI project helps me to train cocoa farmers to improve their livelihoods."

Joseph Merip is the Lead Farmer and Head of the Cocoa Farmers Association on EPI Island, Vanuatu. Through PARDI project capacity building activities, Joseph has been able to improve his understanding of the importance of meeting the production and processing standards of chocolate companies who buy or potentially buy their beans. According to Joseph, PARDI education helps Vanuatu farmers to assess new information on how to meet niche market standards. It enables his community to upgrade bean quality and to potentially sell their beans to chocolate makers instead of the commodity market. These benefits will help him and his community to raise income and develop a strong reputation for Vanuatu's cocoa beans.

Personal snapshots from the Pacific continued

Pranesh Kishore

Improving round pearl quality

"The PARDI pearl project funded my experiments and helped make my research a success."

Pranesh is a Dr of Philosophy candidate at James Cook University and now is in his third year. His research is supported by PARDI and deals with ways to improve the quality of round pearls produced from black lip pearl oysters, *Pinctada margaritifera* in Fiji. The outcome of his work has enabled pearl farmers to understand factors directly responsible for varying quality of pearls.

Janice Natasha-Kishore

Sustainable seafood industries – value-added tilapia

"PARDI effectively sponsored the Fiji consumer acceptance research which was a vital component of my study."

Janice was awarded with an ACIAR/ University of South Pacific (USP) scholarship in 2011 to complete a Master of Science in Marine Science at USP, Fiji. Her research has been funded under the PARDI project 'Value adding and supply chain development for fisheries and aquaculture products in Fiji, Samoa and Tonga'. The study explored aquaculture production, through to post-harvest processing to identify how to foster sustainable seafood industries in the region. Her study focused on the development, shelf-life prediction and consumer acceptance of value-added products from tilapia. Four value-added products were developed and consumer acceptance tested. While the study demonstrated shelf-life stability and high consumer acceptance of tilapia value-added products, it also highlighted obstacles to post-harvest processing and commercialization. Possible solutions are scope for further research.

Noel Kalo

New opportunities for tamarind and canarium nuts

"My involvement in PARDI has enabled me to undertake value chain assessments and address issues important to the development of primary industries in Vanuatu."

Noel holds a Bachelor in Agriculture from the University of the South Pacific. He has been the local project coordinator for PARDI's 'Integrated value chain analysis on Vanuatu's primary industries' which resulted in the tamarind chain review.

In his role, Noel has been responsible for organizing logistics and conducting a series of review activities including developing program activities, undertaking field assessments, market surveys and regular progress reporting. This work resulted in a second phase of research, in partnership with the University of the Sunshine Coast, on "Improving processing and marketing to improve tamarind value chain in Vanuatu". As a result, Noel has been closely involved with improving tamarind processing and farmer skills in the region. Through PARDI, Noel has also worked with the University of Adelaide on the canarium (Nangi) project and conducted consumer research in Vanuatu.

"Local people are closely engaged in our work and this gives them considerable skills to help realise the true potential of their industry," PARDI Fisheries component leader Prof Paul Southgate.

Sandrine Wallez

Connecting cocoa farmers to income earning opportunities

"PARDI is a key partner for ACTIV and the cocoa farmers in the islands and highly contributes to our major achievements."

Sandrine Wallez is the founder and president of Alternative Communities Trade in Vanuatu (ACTIV), established in 2008 as a national union of associations, cooperatives, small producers and other individuals to work with local communities to improve their livelihoods. Since 2011, ACTIV has sought to create a local chocolate factory in Port Vila. Aelan Chocolate Makers was created in September 2013 and should open early 2014. With PARDI input, ACTIV has been able to conduct farmer workshops on best agricultural practices; they have been able to educate industry about improved cocoa processing including fermentation boxes and solar driers, and they have been able to assist local industry to participate in research with quality chocolate businesses including Haigh's Chocolates and Bahen & Co from Australia.

Ioan VijiNakarai Vutilolo

Potential of whitewood as an indigenous timber tree species

"I have had the privilege to work with PARDI and do appreciate and support its significant contribution."

Ioan VijiNakarai Vutilolo is from Tangoa Island, South of Espiritu Santo in Vanuatu. He holds a MSc in Biology from the University of the South Pacific. In 2010, Ioan was funded by the ACIAR/ PARDI project to complete his postgraduate studies and was sponsored to participate in the Dillon Leadership Fellowship scheme. He is currently employed as a principal forest officer with the Government of Vanuatu.

The purpose of Ioan's research was to outline the potential of whitewood as an indigenous timber tree species for Vanuatu and the South Pacific. His thesis "Inheritance study on whitewood (*Endospermum medullosum* L. S. Smith) characteristics of economic importance in Vanuatu," draws together information on the utilization of economically important indigenous tree species in Vanuatu and the South Pacific.

"PARDI's innovative cocoa project connects producers with world-class chocolate makers. These farmers and companies are committed to and excited about their partnerships," PARDI researcher Prof Randy Stringer.

Strong synergies the key to agribusiness success

Jimmy Rantes is from the Vanuatu Department of Trade and Commerce and has played a vital role in agribusiness research activities in the region. A friendly and hard-working representative, Jimmy is passionate about helping local people to tap into the many agribusiness opportunities that until recent years have not been realised.

Since the outset of PARDI-funded research in Vanuatu, Jimmy has played a central role in a host of research activities. The projects he has been engaged in include work to improve the livelihoods of cocoa producers and the nation-wide tamarind value chain analysis.

From a research planning level, Jimmy has been involved as a staff member from the Vanuatu Government to refine and expand their government's expertise and understanding of market-based value chain assessment. The capacity building impact of Jimmy's role is such that he has achieved so much more. Fundamentally, he has helped to 'join the dots' between the PARDI team, Vanuatu farmers, local business people and the many project partners across South Pacific countries that are also engaged in agribusiness research.

According to Jimmy, building strong synergies between the various levels of agribusiness is the key to development success. He says it is this 'cooperative' approach that has been at the heart of the cocoa and tamarind work.

"Through surveys and widespread meetings, considerable effort has gone into understanding the various needs along industry value chains so that research is better targeted," said Jimmy.

> ".....I believe we could achieve more through this capacity building approach and would like to see continued research in the areas of non-timber products and fisheries," Jimmy Rantas.

"With the cocoa and tamarind projects, we have built synergies with other funding groups, pinpointed market demand and requirements, and successfully addressed our research goals."

Jimmy believes that good communication has evolved through capacity building and targeted research is part and parcel to this approach.

"I have witnessed a big shift towards research for sustainable and prosperous development. And, producer capacity and product development options have been significantly diversified. The results are very much in line with what we set out to achieve."

On the Government Department level, Jimmy's close involvement in the PARDI project has been successful in building the Department's agribusiness research capacity. One of his main activities has been to undertake a targeted tamarind value chain workshop in Vanuatu and to present and review results among his peers and the industry at large. The review process identified key obstacles preventing local industry from tapping into and meeting market demand. Information has been welcomed by local farmers and businesses alike and further value chain reviews (stage two) will be soon be led by staff from the Department.

"Our Departmental staff have already undertaken their own value chain reviews in beef based on skills they gleaned through my PARDI training. This is proof that capacity building is being mainstreamed into our Government's activities," said Jimmy.

Jimmy sees a bright future for agricultural expansion in Vanuatu and many opportunities for research partnerships such as through the Australian-funded PARDI project.

"Vanuatu could not have advanced this far in the areas of cocoa and tamarind without the input we have had through PARDI. I believe we could achieve more through this capacity building approach and would like to see continued research in the areas of non-timber products and fisheries.

"There are also tremendous opportunities in cattle farming and a potential organic beef market."

According to Jimmy, the influence of cooperative research on this level has extended beyond immediate and obvious benefits, with outstanding long-term benefits for Vanuatu and the region at large likely outcomes.

"The Vanuatu Government can see the significant social and economic results to flow on from agribusiness research and would work closely with PARDI and other Pacific nations in an extension of their research."

"Vanuatu could not have advanced this far in the areas of cocoa and tamarind without the input we have had through PARDI ..."

Participants at an original tarmarind supply workshop in Vanuatu. Jimmy is pictured in the front row, third from the right.

Close-up of Jimmy holding unprocessed tamarind.

Jimmy Rantes and Department of Trade and Commerce representative, Noel Kalo, are pictured alongside a tamarind tree in Vanuatu.

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New business approach embraced by Fijian vegetable farmers

The first official participant guarantee system (PGS) groups in Fiji's history were registered in February 2014. Three PGS groups from the Sigatoka Valley met on February 25 to take the final steps to register their groups as Companies.

Company status gives the farmer groups legal standing and is a first for Fiji. It will help the groups to enter into contracts and to coordinate the production and sale of their produce to large and exacting institutional markets and to meet consumer demands in the hospitality industry. A Cooperative from Koronivia (near Suva) also chose to adopt the PGS model. The development of PGS in Fiji is part of an ongoing PARDI project to empower local agricultural industries to produce more and increase their incomes.

Background

A major area of Government agricultural policy in Fiji is food security and reduced reliance on food imports. Research has shown that the average size of Fijian farmer holdings is generally 2ha or less. This significantly limits the capacity for farmers to supply produce to institutional markets, such as international resorts. Strict quality requirements for produce have also not been attainable by smallholder farmers who lack the skills to produce at the required level. These factors have contributed to a high level of imports along with a steady decline in food security.

Initial PARDI PGS studies found that these issues can be overcome through the formation of groups which are capable of producing the necessary quantities and quality, through targeted capacity building efforts.

To extend the PGS research findings into on-ground development, our research team embarked on an awareness and adoption campaign, and sustained training in business and marketing.

In the first phase, Fiji farmers were briefed about how PGS groups work and how they can help overcome quality and supply issues. The groups were advised that PGS is a new agribusiness system that requires weekly input by members and production throughout the year. Several farmer groups indicated they were keen to become involved and to form their own PGS groups.

The next stage: PGS training

According to PARDI agribusiness specialist, Dr Rob Erskine-Smith, the interested groups were then involved in awareness meetings, which were followed by more in-depth two-day courses about PGS design. "We staged a number of farmer courses to give interested parties an understanding of the democratic, self-reliant principles of the groups, and the values of trust, mutual support and cooperation," said Dr Rob Erskine-Smith. "Operations and management requirements were explained at length including the importance of a group committing to production contracts. So for example, if a group agrees to supply 100 Kg of tomatoes every Tuesday, then that is what they will do without fail."

Participants were advised that they would be given further agribusiness training and knowledge support by the project until they were able to operate on their own. PARDI has also since produced an information package including written and online training material: http://www.spc.int/lrd/pardi-publications/pgs-package.

What is PGS?

A participant guarantee system (PGS) is a quality assurance system guaranteed by producers. PGS seeks to provide reliable, consistent quality supplies of premium agricultural products at agreed volumes to specific markets. To practice PGS, a group of farmers form a company and run their farm businesses as members. The group consists of a president, secretary and treasurer. The company is owned equally by members and profits are paid to members according to the produce they supply. The company holds a small portion of the group's income for operations (i.e. to transport product, run a cool room etc).

"... the average size of Fijian farmer holdings is generally 2ha or less. This significantly limits the capacity for farmers to supply produce to institutional markets, such as international resorts."

Dr Rob Erskine-Smith conducts a PGS training session in a village in Fiji.

Fiji vegetable farmers make their commitment to PGS official.

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New business approach embraced by Fijian vegetable farmers continued

Group formation becomes official

In mid-2013, the first PGS groups committed to a course of action. The next level of training gave them the fundamentals to legally form a group and begin operation in 2014 (ie: bargaining power, sales techniques, and transportation options). “This was history in the making,” said Dr Rob Erskine-Smith. “Each group went on to prepare a business plan that set out their objectives, resources, production plan and cash flow budget.”

Fiji’s first formal PGS groups have 16 or so members and with PARDI support, have each established a set of rules and elected an executive board. The PGS group design stipulates they will be run as registered companies with a President, Secretary and Treasurer as the Directors. The cost of membership set by the farmers is Fj$50 each, and initial funds are combined to pay for the cost of company registration.

Official group business plans show each farmer planting ¼ of an acre of tomatoes in groups of four giving a total of an acre each month. The second four plant their acre in the second month and so on. Conservative estimates show combined production of the three Sigatoka groups rising to three tonnes per week (compared to the capacity to produce 4-500kg without PGS), including 400 - 800Kg of Grade 1 international standard to be sold to resorts. The remainder will be sold at the Suva Municipal Market.

The production season is usually eight to nine months long, but the PGS groups will produce out-of-season crops (in the wet-season) to take advantage of higher off-season prices. Some protective structures are expected to be used for this production. However, low-cost, low-technology methods, such as bamboo frame grass roof weather protection or veranda ripening houses, are used wherever possible.

Early triumphs point to a bright future

Although there were numerous villages that expressed interest in PGS, some dropped out when the level of work and self-funding needed to operate became clear. However, the clear understanding that this is farming as a business was seen as very desirable by the groups that have fully committed to take on the full development of their PGS Company. While there are many more groups who stand to benefit from a PGS model, the involvement of four very willing groups (three Companies and one Cooperative) is a significant triumph in the first stage of the PGS project.

The Fiji vegetable industry’s first-ever trial commercial shipment of tomatoes was staged as a test-case PGS group in 2013 to help demonstrate and give some personal experience to the farmers about the value chain and their involvement. The trial shipment of first-grade tomatoes from Qereqere PGS Group was sold to the Fijian Shangri-La Resort. Farmers were able to “walk the chain” and experience the processes personally. They received a price that was around double their usual payment. Considerable motivation from this activity helped to boost support for the PARDI PGS work which is now focused on the first official commercial shipment of tomatoes in March/April 2014.

Looking ahead, the PGS research team hope to expand adoption of PGS across vegetable farms in Fiji to encompass around 30 groups.

"This was history in the making ... each group went on to prepare a business plan that set out their objectives, resources they required, and a production plan and cash flow budget," Dr Erskine-Smith.

Tomatoes are sorted and graded by members of the Qereqere PGS group and PARDI project PG staff in preparation for the 'trial shipment' of commercial tomatoes.

FEATURE STORY

Breadfruit and the benefits of farmer training

Training land owners in breadfruit propagation techniques could provide a big boost for a crop that could potentially become one of Fiji's most important food industries. A trial of a novel approach to establishing breadfruit has given a group of young landholders the ability to propagate breadfruit plants for their own farms and for commercial sale.

Conducted by Fiji's own Tutu Training Center (TRTC), with funding through PARDI's Pacific Breadfruit Project (PBP), the initial training attracted over 100 male and female farmers from Vanua Levu villages.

As a sought-after commodity, both nationally and internationally, the significant educational and plant breeding benefits from the training make an interesting case study for future expansion of the industry.

Survey fundamental part of training

In early 2013, PBP researchers conducted a survey in collaboration with the TRTC across seven villages in the Tunuloa peninsula of Vanua Levu (the second largest island of Fiji). The survey included hands-on propagation training along with other education and information gathering.

The aims of the survey were to:

- Provide hands-on training on marcotting propagation
- Undertake rapid (due to time limits and remoteness of location) breadfruit variety and fruiting pattern surveys
- Provide training and promotion of breadfruit as a crop to village farmers
- Undertake to replenish the PBP planting material collection destroyed in the 2012 floods
- Lay the early foundations for a long-term mutually beneficial relationship between the training center, the PBP and breadfruit resource owners in collaboration with the Fiji Ministry of Agriculture and the Secretariat of the Pacific Community (SPC's) Centre for Pacific Crops and Trees (CePact).

This survey and accompanying training have shown there is strong interest in breeding and propagating high-performing breadfruit varieties among smallholder farmers to boost village outcome.

The success of this is such that the PBP team, in collaboration with the Ministry of Agriculture, SPC CePact and TRTC, will expand their survey to cover other villages. This will help to potentially develop more village-based nurseries (through the Tutu network) to propagate breadfruit for the emerging industry on VitiLevu.

Activity manager Livai Tora provides training to village farmers using information sheets as a guide before hands on training.

Breadfruit technical officer Kaitu Erasito with village farmers after training.

A lady farmer has hands-on training on propagating breadfruit using root suckers.

MORE INFORMATION

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South Pacific pearl industries flourish thanks to research and training

BOOSTING PEARL OYSTER PRODUCTION

ACIAR/PARDI pearl research actively involves Fijian village groups in pearl oyster production to provide livelihood opportunities for women and young people. Training spans all levels of the production chain, from 'spat' (baby oyster) collection, supply of oysters to pearl farmers, half-pearl and mother-of-pearl production, jewellery design and manufacture through to the overarching principles of running a sustainable and profitable business. This work is enabling South Pacific people to tap into niche, high-value commodities.

Collecting and utilising baby oysters

In Fiji, in terms of annual national income derived from fisheries commodities, pearls are second only to tuna. However, in the case of pearls, there are considerable untapped domestic and international opportunities. In 2010, ACIAR/PARDI pinpointed the unreliable and limited availability of spat (baby oysters) as a major hindrance to the industry's ability to expand or to value add. Through the PARDI pearl project, researchers set about determining how to increase spat supplies and boost industry potential.

Pearl farming begins with the collection of spat, either from natural spawning in the open ocean, or from adult oysters spawned in hatcheries. In Fiji, the great majority of spat are collected from the ocean using "long-line spat collectors". These are fibrous ropes, set in the ocean for several months, onto which free-swimming larvae settle and grow into juvenile oysters.

While the collection of spat is not difficult, it requires maintenance of the lines and careful handling of the juvenile oysters. Skill is required to recognise valuable species and to separate less valuable by-catch that settle onto the ropes.

To this end, PARDI's research and assistance has focused on training community women's groups to collect spat and maintain the baby oysters. Communities can generate income from sales of spat to pearl farms, sales of shells and mother-of-pearl or, others may opt to retain oysters for pearl and handicraft production.

Village-friendly structure provides big income boost

Due to PARDI training, structured routine spat collection now occurs at 15 communities throughout Fiji. Benefits of formalised spat collection are flowing directly to the women, their families and the Fijian pearl oyster industry. In Novunieva village, for example, this research has helped the community double their capture of spat (by providing five extra spat-collection ropes). Their first harvest of 2,000 oysters in 2013 sold for Fiji $4,000 (about AU$2,300). The villagers have since built a shop from these proceeds, and aim to double their income next harvest and earn enough money to purchase a boat. Based on their success, another nearby village has taken up spat collection.

Similarly in Nukavalabu, villagers sold their spat harvest to Fiji's largest pearl company, J. Hunter Pearls for $4,200 (http://www.fijipearls.com). With their new-found spat collecting capacity, the village plans to expand into mother-of-pearl handicrafts and mabé (half pearl) production which can target the local tourist trade.

A village boat surveys their long lines to check for spat recruits.

"Due to PARDI training, structured routine spat collection now occurs at 15 communities throughout Fiji."

Novunieva and Nukavalabu villages previously relied on minimal income from fish sales,a livelihood which is inherently difficult to produce and trade due to the region's rugged terrain.

Industry capacity increases as more villages come on board

Benefits of research and training in the region are proving to be far-reaching, both socially and economically. Spat collection training is boosting industry capacity on a supply level. And on a product diversity level, the PARDI pearl project is helping to diversify pearl products from Fiji and improve pearl quality (ie research to improve the quality of cultured round pearls, production of half-pearls and mother-of-pearl handicrafts training – related stories are covered on the following pages).

A bright future for Fijian pearls

The future holds great promise for communities and pearl producers in Fiji. Prior to PARDI research, availability of oysters was a major bottleneck. However, the industry is expanding now on many levels due to improved oyster availability. This trend is also acknowledged by the Fiji Government. In early 2014, Suresh Chand, Director of Fisheries in Fiji, announced that his Government's focus has shifted from defining the pearl industry as a reasonable export earner to an industry achieving community engagement through the strong employment and income it generates. Accordingly, the national budget to assist more communities to enter the spat collection industry in northern Fiji was doubled in 2014, and the government is considering a nation-wide pearl industry stimulus package.

A Fijian pearl farmer learns the fundamentals behind spat collecting at Namarai, Viti Levu.

"The value of Fiji's cultured round pearl crop has increased by about thirty percent due to the adoption of net-based husbandry practices."

Close-up of juvenile oysters or spat that have settled on the spat collectors.

South Pacific pearl industries flourish thanks to research and training continued

DESIGNING AND MANUFACTURING LOCAL PEARL PRODUCTS: MOTHER OF PEARL

Many Fijian villages now have greater access to pearl shells and mother of pearl (MOP) as a result of increasing supplies of pearl oysters shells through the ACIAR/PARDI spat collection program. MOP is the shiny silver-white material that lines the inner shell surfaces of pearl oysters and some other molluscs. It is the same material that forms cultured pearls hence the term 'mother' of pearl. Like pearls, MOP has the ability to be crafted into valuable jewellery items. ACIAR/PARDI-funded mother of pearl (MOP) handicraft training is giving village people the skills to design and make jewellery and sought-after handicrafts.

Locally-made versus imported items

In recent years, the South Pacific tourist trade in MOP handicraft and jewellery items has been dominated by imported items from South East Asia. As part of the PARDI Fisheries Pearl Project, scientists aim to turn this trend around. Through training, the scientists are enabling Fiji (and Tonga) to develop their own industries and improve their livelihoods through import replacement.

According to PARDI Fisheries Component Leader, Prof Paul Southgate of James Cook University, PARDI research in Fiji has highlighted strong demand from tourists for items with a Fijian origin and style.

"Locally-made MOP items (such as jewellery and handicrafts) are sought after by tourists, and this sector of the industry has an estimated annual value of more than F$10 million," said Prof Southgate.

"This level of buyer interest is an important consideration in our handicraft training. The PARDI MOP handicraft training program employs local trainers and involves collaboration with the Fiji Arts Council and major retail outlets to help create unique local products."

First training program a big success

The first handicraft training program was held in Ba, Viti Levu during early 2014 and has been a huge success. A group of nine women from the Ba Women's Forum participated in a PARDI MOP handicraft training program. The trainees from the Ba group formally graduated in mid-March and a second phase of the MOP training project will begin in April to produce commercial quantities of high-demand MOP handicraft items. These will be used to support marketing research within the Fijian handicraft sector. The official trainee graduation was attended by Fiji's Attorney-General, the Minister and Permanent Secretary for the Ministry of Industry and Trade along with senior representatives from the Ministry of Social Welfare, Women and Poverty Alleviation.

Handicraft training in action: two female students learn how to prepare and polish an oyster shell before it is cut for handicraft production.

Spat collection makes further growth likely

So far, MOP handicraft training has only been held in Ba. But according to PARDI researcher Assoc Prof Anand Chand of USP, broad interest among other villages and increasing availability of MOP in the region means there is potential for similar training to be held throughout Fiji.

"Further training, similar to that in Ba, is very feasible given that the PARDI Fisheries spat (baby oyster) collection program is increasing the availability of pearl oyster shells," said Assoc Prof Chand.

"For the first time in Fiji there is a structured and effective spat collection program and more oysters are becoming available to pearl farmers and communities throughout Fiji. This is supporting a growth in MOP handicraft production."

"The official trainee graduation was attended by Fiji's Attorney-General, the Minister and Permanent Secretary for the Ministry of Industry and Trade along with senior representatives from the Ministry of Social Welfare, Women and Poverty Alleviation."

The Ba Women's Forum training group with their trainer pictured centre front.

BUSINESS SKILLS TRAINING HELPS FARMERS ACHIEVE THE WINNING EDGE

Fijian and Tongan pearl farmers have been learning basic economic principles, business management and marketing during PARDI-run business skills workshops. Many communities can see the potential that is now presented through pearl farming and are keen to pursue sustainable development of the industry.

Increased interest in value-added pearl farming (stimulated by the PARDI spat collection program) has been behind the new demand for business skills training. According to Pearl Project Leader, Prof Paul Southgate, workshops began in Fiji in 2013 and have been popular because they enable farmers to make 'sound economic decisions' for their communities. "By providing farmers with the keys to business planning and the ability to review their operations, they can work with a better understanding of risk analysis and cost management," said Prof Southgate. "These are two of the keys to running a successful, profitable business."

The three-day workshops are based around economic modeling software developed by Bill Johnston from the Queensland Department of Agriculture Fisheries and Forestry. Business principles training is provided by Damian Hine of the University of Queensland.

To date, workshops have extended beyond the realm of training towards building some of the structures needed to manage a business well. During the 2013 workshops, trainers assisted farmers to develop whole-farm economic models (decision tools) for their individual pearl farms. Now, for the first time for any pearl producing country, economic models for spat collection and value adding activities (e.g. MOP handicrafts) have been developed.

Prof Southgate predicts that these models will help farmers to make important business decisions about their pearl products and will have a big impact on the industry's future. "Whole-farm models can help a farming community determine which streams of pearl production they can pursue and to what level they can sustainably grow their business," said Prof Southgate.

Local financial representatives also attended the workshops to help farmers establish relationships and to assist them and lending institutions identify how rural industries are able to satisfy capital lending requirements through the use of economic decision tools taught during the workshops.

Dr Damian Hine is pictured with participants at the business skills workshop held at Rakiraki, Viti Levu.

The Pearl Business Skills workshops were jointly funded by ACIAR/PARDI and the EU-Increasing Agricultural Commodity Trade (IACT) program.

South Pacific pearl industries flourish thanks to research and training continued

KNOWLEDGE ENHANCEMENT: ENABLING FIJI TO TAP INTO UNIQUE PEARL QUALITIES

Many pearl famers across Fiji now have greater opportunity for income generation thanks to PARDI-funded studies into the quality of cultured round pearls (produced from the black lip pearl oyster, *Pinctada margaritifera*).

Headed by Pranesh Kishore, research has looked at the benefits of improvements to husbandry practices with particular focus on the effects of various culture methods on pearl quality. Pearl husbandry begins when baby oysters or spat are collected from the wild or bred in hatcheries. Larger oysters are grown in various culture units and each can influence growth rates and survival of pearl oysters and the quality of their pearls.

Mr Kishore's research pinpointed which culture methods work best and his results allowed him to recommend better net-based culture methods than previous standard industry practice. His recommendations have been widely adopted by Fijian pearl farmers.

According to Fiji's largest pearl farmer, Justin Hunter, Mr Kishore's research into pearl oysters has been of enormous benefit to the industry. "The value of Fiji's cultured round pearl crop has increased by about thirty percent due to the adoption of net-based husbandry practices," said Mr Hunter. Professor Paul Southgate said such a development may be worth millions of export dollars. "This is a major industry impact that will benefit Fijian people and the local economy for years to come."

Prior to conducting the round pearl research (while completing his Master's at USP as an ACIAR/USP Scholarship holder), Mr Kishore assessed the feasibility of half-pearl (mabé) culture in Fiji from the winged pearl oyster (*Pteria penguin*). His research showed that high-quality and well-coloured mabé can be produced in Fiji and provided the basis for subsequent and continuing commercial production of mabé for export to Europe and for domestic sales. Ultimately, Mr Kishore's research instigated the development of a new, sought-after niche product for the Fijian pearl industry.

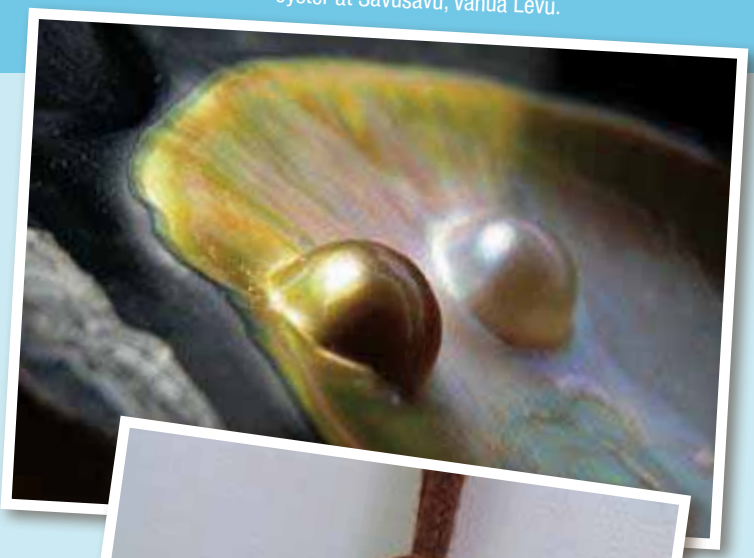
"Ultimately, Mr Kishore's research instigated the development of a new, sought-after niche product for the Fijian pearl industry."

MABÉ PEARL PRODUCTION ... ANOTHER PROMISING OPPORTUNITY

Local people and pearl farmers involved in the PARDI spat collection program collect both blacklip and winged pearl oysters (otherwise famous for the production of mabé pearls). Mabé (pronounced mar-bay) are half-pearls or blister pearls. They are made by gluing several hemispherical nuclei to the inside surface of pearl oyster shells. Over a period of around 10 months, the nuclei are covered which nacre (mother of pearl) forming the mabé. Mabé pearls vary in size from 12 to 20 mm in diameter.

Given the relative simplicity of mabé production, there is great opportunity for spat collecting communities to enter the pearl industry through mabé production. With this in mind, the PARDI pearl project has also held mabé training workshops for pearl farmers and communities to facilitate this development. The training involved teaching people how to handle and prepare oysters, the technique required to produce the highest quality mabé and husbandry of oysters that have been 'seeded' for mabé production. Follow-up training will cover the harvesting of mabé and their use in both jewellery and handicraft items.

A stunning gold mabé pearl is harvested from an oyster at Savusavu, Vanua Levu.



Beautiful Fijian mabé jewellery items are sought after around the world.

Round pearls from Fiji: Fijian round pearl have unique qualities resulting in high demand and high value. (Photograph courtesy J. Hunter Pearls Fiji)

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PARDI and United Nations Women combine forces to enhance women's livelihoods

South Pacific women are vital to the region's economy and social wellbeing. Most village women juggle the roles of mother and housekeeper along with agricultural produce distribution and market sales person. In the majority of cases, women's young children accompany their mothers to work at marketplaces or roadside stalls.

Through extensive social research and broad community interviews, the PARDI *Retail Transformation Project is highlighting the critical role that women play in their family's livelihoods. Many considerable challenges, including difficult working conditions and living standards, faced by rural women and their children have been addressed through these surveys. More recently, United Nations Women (UN Women – an entity for gender equality and the empowerment of women) and PARDI have joined forces to boost efforts in this area. The combined knowledge and people power of the partnership is a unique example of capacity building in the South Pacific.

Retail transformation: whole-chain analysis includes women

The Retail Transformation Project is the first project of its kind in the region designed to gain a better understanding of the whole chain including information on consumer trends and shopping patterns, traditional and modern market channels, traders and local producers. While conducting focus group surveys (as part of the Retail Transformation project) in Suva's Municipal Markets in 2011, PARDI researchers and University of the South Pacific (USP) Faculty of Business and Economics students crossed paths with representatives from the UN Women Fiji Office. During the focus groups, researchers discovered there is a lot of crossover between PARDI's and UN Women's efforts to understand and enhance women's livelihoods. Soon after, the two groups formally agreed to work together.

According to project leader and value chain analyst, Craig Johns, understanding the role of women adds depth to the retail studies. He said the involvement of UN Women will benefit research outcomes and South Pacific women.

"The capacity of our research efforts is such that, in partnership with the Ministry of Agriculture, USP and UN Women, we will soon undertake a survey of 600 producers across the country," said Mr Johns. "PARDI researchers, UN Women staff and USP students are engaging with women producers, traders and market stall vendors to better understand opportunities for improving their working lives."

Mutually beneficial partnership evolves

UN Women representatives are interested in defining the impact that women have across the whole value chain and can see the merit behind joint research with PARDI. The PARDI/UN Women partnership is leading to knowledge sharing and capacity building for UN Women's key staff.

According to regional programme specialist for UN Women Fiji, Preeya Ieli, the partnership will significantly improve research capability. "Our staff are learning from PARDI, and with our help, PARDI is expanding their surveys," said Ms Ieli.

"In addition to the Fiji producer surveys, PARDI will run 100 trader surveys in partnership with the Fiji Ministry of Agriculture and USP.

"Our direct involvement in this component of the research (UN Women representatives will have a role throughout the whole survey process) means that UN Women staff will have an incredible opportunity to learn formal research survey process including project management, questionnaire development, implementation, enumerator training, data analysis and communication of insights."

Direct UN Women training and input

The next stages of PARDI's retail transformation research will be strongly influenced by UN Women's direct input. Mr Johns said a UN Women representative from Fiji, Vilisi Veibataki, completed enumerator training with PARDI in 2014. Another two representatives, one from the Solomon Islands and one from Vanuatu, will join the project for the trader survey component in 2014.

"This will be a very exciting and productive phase of the retail transformation research," said Mr Johns. "Ultimately, by employing a cooperative approach, research carried out today will build capacity for the future. This creates certainty and a promising future. It means that research will not begin and end with PARDI."

Retail transformation municipal markets studies: Key outputs timeline

- March 2011: In collaboration with UN Women, PARDI-funded

"PARDI researchers, UN Women staff and USP students are engaging with women producers, traders and market stall vendors to better understand opportunities for improving their working lives," Mr Craig Johns.

Young children often accompany their mothers to market.

Women are the South Pacific's distribution and sales people.

students from USP conduct 'dot surveys' at Suva Market, Fiji.

- April 2011: PARDI Suva market research study report - vendor focus group Discussions summary and recommendations.
- July 2011: Partnerships to improve markets project, scoping mission of Vanuatu Markets – report.
- March 2012: Partnerships to improve markets stakeholder engagement and project planning workshop. SHEFA Province, Vanuatu, workshop report and planning priorities.
- May 2012: Product development workshops to increase women market vendors' incomes from Vanuatu.
- Nov 2012: The invisible worker, women in agriculture in Fiji – A case study.
- 2013: PARDI and UN Women scoping – planning for future work with producers, traders and vendors in municipal markets.

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FEATURE STORY

Champions for chocolate - smallholder cocoa farmers linked to high-end chocolate makers

Through PARDI, smallholder cocoa farmers in Vanuatu are linking up with Australian and US chocolate makers enabling new economic opportunities. The project 'Facilitating improved livelihoods for Pacific cocoa producers,' is focusing on ways to help cocoa farmers shift from exporting a low-value yet important commodity crop to producing a much higher value 'niche market' product.

Research addressing local cocoa farming issues and in-depth value chain studies began back in 2010. The value chain approach focused on understanding and meeting consumer needs. The project was well-timed to coincide with growing interest in South Pacific cocoa from a number of high-quality chocolate makers, some of whom have since become invaluable project participants.

Australian chocolate companies Haigh's Chocolates and Bahen & Co., and United States (San Francisco)-based Guittard are three of the companies providing support. They assess cocoa bean quality and recommend how farmers can change practices to reach higher standards and receive premium prices.

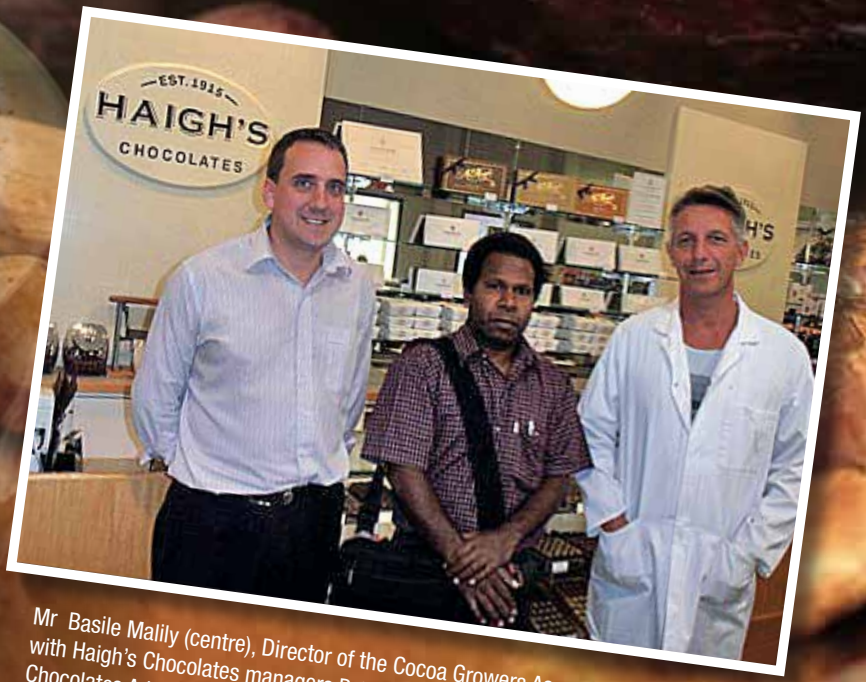
For example, Bahen & Co produced chocolate from different Vanuatu cooperative cocoa samples and then went back to Vanuatu with the research team to carry out taste-testing sessions with the farmers. They identified quality defects resulting from smoke taint and under fermentation - this was a very powerful exercise considering some farmers had never tasted chocolate before.

Guided by this feedback, researchers are working with the farmers to improve bean-drying practices and avoid smoke tainting - a common quality issue across the South Pacific.

Project leader Prof Randy Stringer of University of Adelaide says cocoa farmers are inspired by the ongoing advice, support and encouragement provided by collaborating world-class chocolate companies.

Local business interest in niche market chocolate has also skyrocketed. In the coming months, Alternative Communities Trade in Vanuatu, a major partner in the cocoa work, aims to establish a small factory to produce high-quality local chocolate. Later in the year, project partners will stage a first-ever, national chocolate-making competition to coincide with Vanuatu Tourism's gourmet food week.

Through activities such as these, Vanuatu smallholder farmers are improving their cocoa industry's capacity and mapping out a strong reputation across national and international cocoa arenas. In the future, they are likely to be able to meet an ever-increasing demand for unique, high-quality cocoa and significantly improve their own livelihoods.



Mr Basile Malily (centre), Director of the Cocoa Growers Association of Vanuatu, met with Haigh's Chocolates managers Peter Millard (left) and Ben Kolly (right) at Haigh's Chocolates Adelaide office. As an industry leader, Haigh's Chocolates is keen to help support sustainable cocoa growing initiatives worldwide.

MORE INFORMATION

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TWO-WAY APPROACH FOR REGIONAL SECURITY

A two-way approach is the central philosophy to ACIAR/PARDI research. Individual farmers, farmers' groups and South Pacific communities are pivotal to furthering agricultural development in the region. Building knowledge and developing skills are based on active participation by all parties

This focus involves the expertise and commitment of researchers, business associates, Government representatives and agencies across the South Pacific. Combined efforts across the value chain empower local people to significantly improve livelihoods in the region.

Our acknowledgements are extended to the South Pacific people, and the many scientists, students, government bodies and business groups involved in agri-business research in the South Pacific.

"The people we represent through PARDI are amazing – it is a privilege to work with such enthusiastic and visionary leaders who are striving for a better future," PARDI Forestries component leader Prof Helen Wallace.

PARDI YouTube

As part of PARDI's efforts to show local people engaged in and benefiting from PARDI activities, PARDI Communications has developed a YouTube page. Topics covered include improving livelihoods in the South Pacific, post-harvest vegetable research, developing productive breadfruit orchards, supporting the vital role of South Pacific women and solar drying canarium nuts.

The video clips can be easily accessed at the following page:
https://www.youtube.com/channel/UCElsoBmKSL6MnOLI_zsn6Wg/videos

OUR PARTNERS

PARDI is a partnership that involves The University of Queensland under the Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of the South Pacific, the Secretariat of the Pacific Community, University of Adelaide, James Cook University, The University of the Sunshine Coast, the Queensland Government's Department of Agriculture, Fisheries and Forestry (DAFF) and Southern Cross University.

Core partners

The University Of Queensland AUSTRALIA | QAAFI Queensland Alliance for Agriculture and Food Innovation

THE UNIVERSITY OF ADELAIDE AUSTRALIA

JAMES COOK UNIVERSITY AUSTRALIA

Queensland Government

USP THE UNIVERSITY OF THE SOUTH PACIFIC

University of the Sunshine Coast The best of both worlds

Growing the Pacific. Growing our future together. L'Océanie, le terreau de notre avenir. SPC Land Resources Division

Collaborators leading PARDI projects

Griffith UNIVERSITY

KOKO SIGA FIJI

Southern Cross University

The above list of partners and collaborators does not represent the totality of organisations that contribute to PARDI. Each individual PARDI project is part of a larger network of collaborators.

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Australian Government
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PARDI