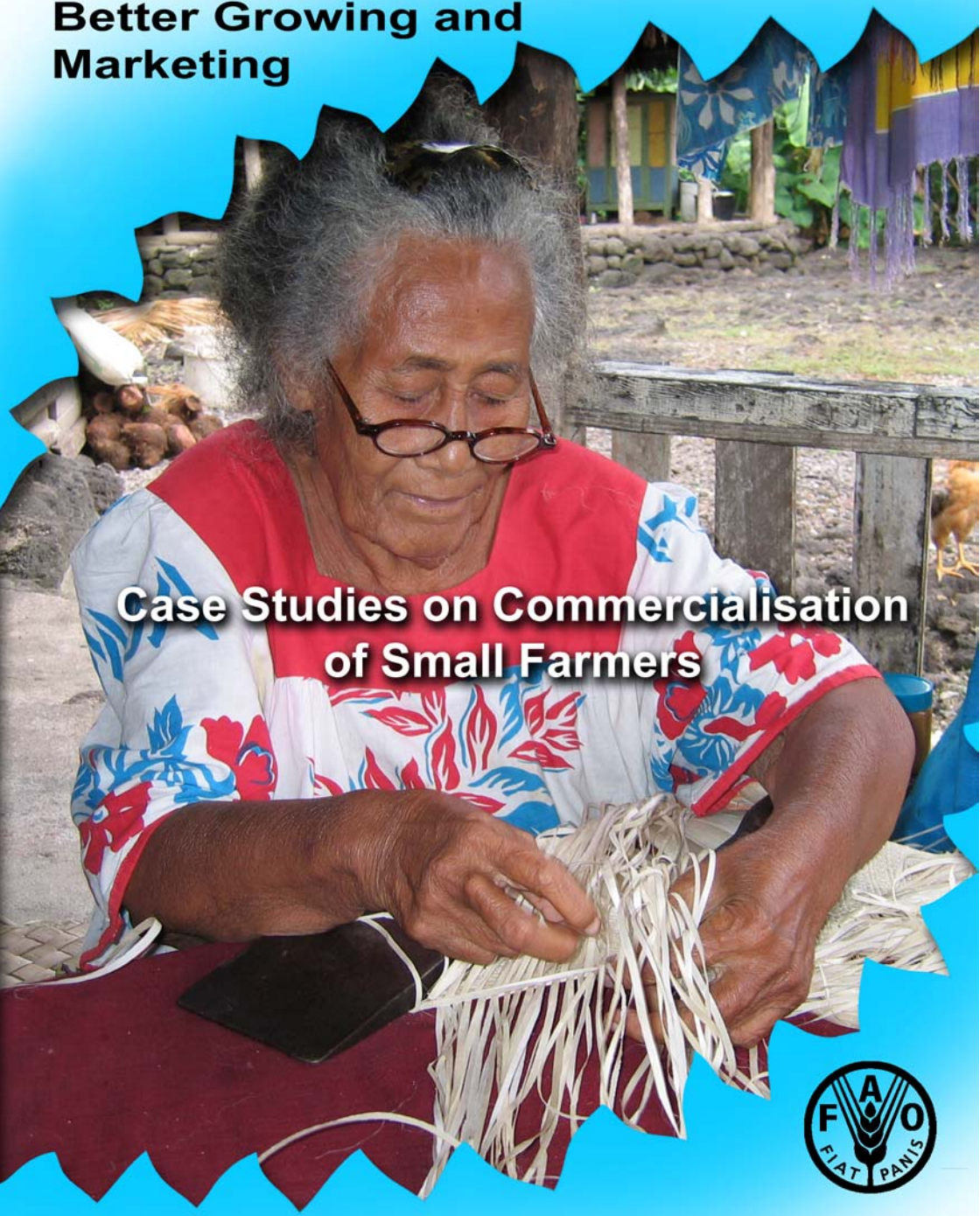
Helping Small Farmers Think About Better Growing and Marketing



Case Studies on Commercialisation of Small Farmers

FAO Pacific Farm Management and Marketing Series 5

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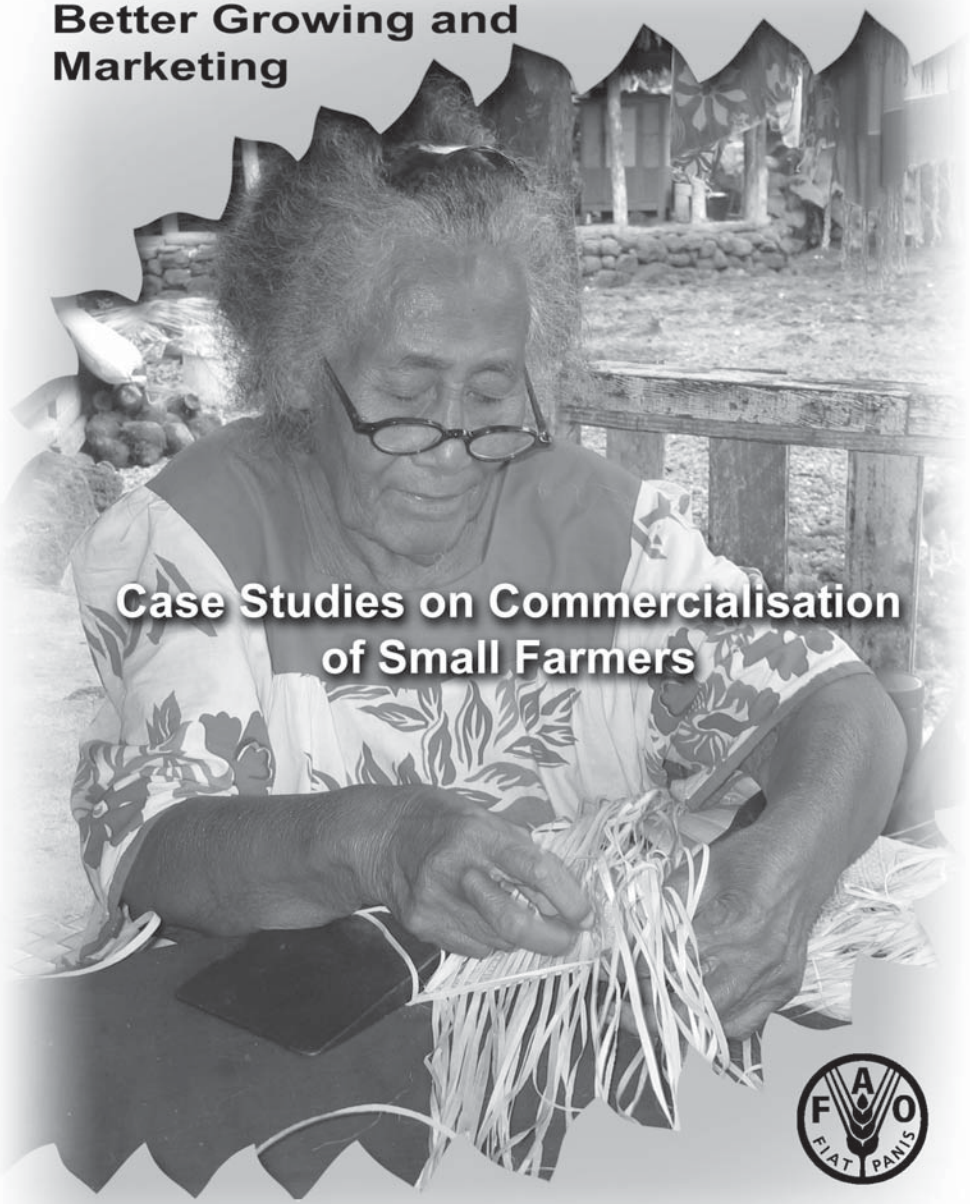

Case Studies on Commercialisation of Small Farmers

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Sub-Regional Office for the Pacific Islands
Apia 2005

ISBN 92-5-105451-7 ISSN 1813-2332

Foreword

The production environments for farmers in the Pacific Island Countries (PICs) have probably changed more rapidly in the last decade or so than they did in the previous half century. As well as problems of maintaining soil fertility as a result of rapidly increasing population densities, farmers and their families are dealing with the reality that the economic and social environment in which they are living is also rapidly changing. Cash is increasingly needed for operating their farms, meeting family/household needs, paying school fees, and also often for meeting social obligations. For many farming families this is a relatively new and often stressful experience. The challenge of adjusting to such changes is made even greater as a result of the trend to globalisation of the world economy and associated free trade. Therefore the farming families in the PICs, the majority of whom are usually thought as operating semi-subsistence (i.e., semi-commercial) type farming systems, are increasingly faced with the situation of having to compete in the market place with products imported from elsewhere.

Increased commercialisation of agriculture in the PICs is inevitable given the realities of the world. The challenge, particularly for semi-subsistence farming families in the PICs, is how they can adapt to, and benefit from, such changes in a way that will not compromise the future welfare of themselves, their families and their communities. The papers in the ***"FAO Pacific Farm Management and Marketing Series"*** are designed to help such farming families make this transition. The overall title for this series is ***"Helping Small Farmers Think About Better Growing and Marketing"***. The series consists of five publications:

No. 1: An Introduction for Trainers and Specialists

No. 2: No Gud Bisnes Bagarup - Introduction for Field Extension Workers

No. 3: A Reference Manual

No. 4: A Training Aid and Exercises for Trainers

No. 5: Case Studies on Commercialisation of Small Farmers

When necessary in the training materials, we indicate the level of facilitators we are focusing on. For example No. 1 and No. 3 are designed primarily for extension and development officers and specialists while No. 2 is geared to field level extension and development workers. No. 4 and 5 are likely to be of interest to all type of facilitators.

While the other papers in the series deal with describing issues on how to help semi-subsistence farming families make the transition to more commercialised farming systems — stressing the strategies and analytical tools useful to facilitate this process — this paper Number 5 is different. As the title indicates it consists of a series of case studies illustrating the experiences of farming families in different PICs in moving along this transitional path. They reflect reality in the field. Some are inspiring and some are discouraging. Some involve support systems and some involve little in the way of outside support. However, almost all reflect the independence, determination, perseverance, ingenuity and resilience of Pacific Islanders in improving the welfare of their families, and sometimes those around them, when progress is often interrupted by periods of adversity. Many different people contributed to these case studies; their names are provided below the respective 'story'. David Norman provided the summaries as well as the introduction chapter to this booklet. Many of the authors have been intimately associated with the experiences described in the case studies. A number of useful lessons can be derived from studying and so an introductory chapter has been written with this in mind.

Contents

1. Some Generalisations from the Case Studies

By
David Norman

Introduction

The specific case studies presented in the following chapters represent particular situations in which farmers – mostly small and semi-subsistent — in the Pacific Island Countries (PICs) are marketing some of their farm production. They illustrate many different aspects of the production process itself and the production to marketing linkage. Although the case studies do not deal with all the issues these activities can involve, they do provide some useful ideas on how to deal with many of them. In this chapter we attempt to systematise some of the major issues, and how they are dealt with, in a more generalised form.

The reality is that, whether they like it or not, families operating small semi-subsistence farms in the PICs are being forced into more cash oriented economies which are increasingly being influenced by what is happening internationally. Farming families increasingly have to use cash for meeting their needs (e.g. paying school fees, buying farm inputs). At the same time the cash income they obtain from entering the market place, is influenced by many factors including the strategy they use and factors relating to the removal of trade barriers (i.e., so-called free trade). Important points to remember when considering how such types of farmers can benefit from increased entry into the market place is that they: are novices in the process relative to others with much more experience; have little in the way of resources and possibly time to devote to such activities; and have little influence on what happens in the market place (e.g., are often price takers). Therefore, what is fundamentally required for them to be successful is to move away from the idea of simply selling surplus production to developing marketing skills, seeking ways to increase their influence in the market place, and develop productive partnerships and alliances with those that can help them benefit from the marketing process. The sections after the next one illustrate some of the ways this can be, and is being done, in the PICs.

The Semi-Subsistence Farming Family

It is important to bear in mind the conditions under which the typical semi-subsistence farming family has operated for many generations in the PICs. They are often located in isolated and inaccessible areas. They invariably grow a mix of crops and trees, often in mixtures, raise livestock, sometimes fish and often pursue a number of other activities some of which generate income. Their objectives are first to produce food for feeding the family and then to locally sell surplus production. Cash and/or food are used to meet extended family needs and fulfil social obligations that can be considerable. All this is done in the context of what is often termed the Pacific Way of Life – simplistically defined as sharing and caring.

The changes that are rapidly occurring as a result of globalisation are threatening what some view as this ideal way of life. Therefore changes that involve such farming families commercialising greater amounts of their farm production need to be evaluated carefully to ensure that the benefits outweigh the costs as far as the farming family are concerned, both in terms of their personal and societal objectives.

Types of Markets

In order to structure the lessons arising from the case studies it is useful to think about three types of markets and deal with each separately. These are the local market, the urban/national market and the export market. In a sense this sequence can be viewed as a logical sequence moving from a type of marketing process that is fairly simple (i.e., supplying the local market) to one that is much more complex (i.e., export market).

The case studies presented in the following chapters include examples of small farming families producing for all these types of markets. There are obviously major differences in the issues that have to be dealt with in being successful in the different markets. However, there are three common features that are important in being successful in any of the three different types of markets. These are:

- Farming families needing to change their mindset from viewing marketing as simply selling to developing marketing skills (i.e., finding out what the market wants and responding to that need).

- Leadership of some sort, either an individual and/or an institution/ organisation, is critically important in playing a catalytic role in getting the marketing process going.
- Facilitating and sometimes establishing direct working partnerships between farmers, and institutions in the public (i.e., government) and private (i.e., non-governmental organisations (NGOs) and commercial firms) sectors. With respect to this, government is particularly important in providing the infrastructure and supportive policies at all marketing levels. Unfortunately limited government resources, disinterest and politics often result in sub-optimal involvement and commitment meaning that the private sector often has to try and play a substitute role.

The Local Market

Producing for the local market is often the least disruptive approach for small semi-subsistence farming farmers. It is something most have done for generations and the diversity of their farming systems can be maintained therefore posing no major environmental issues. A number of case studies illustrate issues of dealing with the local market. There are nevertheless still some problems, particularly accessing the market because of poor roads, the danger of over supply, and sometimes lack of physical market stands. One of the Solomon Islands case studies illustrates how the entrepreneurial leadership of one couple in a village has successfully got a group of farmers in their home village to collaborate: in carrying the goods to be marketed to an access road; taking turns in supplying the local market; eliciting advance orders from potential clientele and constructing a physical market stall at the local market. The PNG case study illustrates, in addition, another facet of successfully commercialising an agricultural product, namely a local organisation helping farming families to use their cash wisely in improving their welfare and overall health (e.g., pit latrines and nutrition gardens).

Unfortunately misfortunes arise both personally and nationally that can sometimes disrupt and even reverse such progress. Civil strife in both the Solomon Islands and PNG have had negative impacts but its citizens have shown a remarkable resilience to continue initiatives after such troubles are over.

The Urban/National Market

Some of the case studies demonstrate a potential linkage between the local market and an urban or national market. For example, case studies for the Solomon Islands illustrate that local leadership that has used the local market for marketing produce as a starting point has then, based on that experience, moved on to applying the same principles to a provincial or national market. This has once again involved collaboration between farmers in initial movement of the product to an accessible road and taking turns in supplying the urban market. Another principle to ensure a constant supply to the market and to avoid possible customer disappointment has been to arrange for other farmers outside the group to provide products when they were in short supply within the group.

Another case study from the Solomon Islands involves water cress, a new crop to farmers, which has been marketed immediately at the urban area – in this case Honiara – because of the proximity of the farmers to that market. This case study also demonstrates the ingenuity of farmers in developing a technology for growing it that can enable it to survive river level fluctuations.[1] It also demonstrates the willingness of farming families to collaborate in benefiting from growing water cress by allocating specific areas of the river to different families. However it also demonstrates a problem that can arise when outside support is not readily available for identifying solutions to problems that farmers cannot solve themselves – in this case pest build up.

In fact insect and disease problems often appear to develop when production levels build up – see, for example, the water cress and watermelon case studies in the Solomon Islands and the squash[2] case study in Tonga. All reported over time increased resistance of insects and diseases to the sprays and negative health consequences for those spraying. Increasing use of such chemicals plus fertilisers is raising increasing environmental concerns that could have long term negative impacts on the farming systems practiced by small farmers. These types of problems indicate that commercialisation of small farmers' agriculture is not a simple matter if it is going to be successful. Initiatives to stimulate commercialisation need to proceed with caution, especially when unfamiliar technologies are involved and external inputs, particularly chemicals, are involved. The implication is that support systems need

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1 There are also examples in other case studies that illustrate the ingenuity and efforts of farmers to develop innovative ways of dealing with problems.

2 It is important to note however most of the squash is destined for the export market.

to be put in place to ensure that such families do not become even more vulnerable in being adversely affected as a result of their adopting changes. Ideally government extension staff should provide such functions but in their absence NGOs probably need to play such a role.

Thus as new technologies are introduced and unfamiliar external inputs are increasingly used, farmers need help in accessing them and in ensuring they are used in ways that are not detrimental. Such organisations also become increasingly important the further the market is from the farmer (i.e., urban/national and export markets compared with local markets).

Product quality and timely and regular product delivery become much more important in urban and national markets, particularly if there are contracts with hotels, etc. Such markets are often important in transitioning to developing an export market. For example in a case study from Tonga there are plans to produce and initially supply kumala chips to Tongan hotels prior to channelling them to the export market. A robust domestic market for a product helps reduce the vulnerability of farmers to fluctuations in the international market. The case studies on root crops and kava indicate the lack of vulnerability of farmers to producing these crops relative to squash which is almost all destined for the export market.[3]

The Export Market

Small farmers have little influence or power as far as the export market is concerned. Instead whether or not they benefit from producing for the export market is critically dependent on the intermediaries – government, NGOs, and sometimes commercial firms including large commercial farms. The PICs' economies are small and remote from major international markets, making it difficult for them to compete in terms of export quantities with exports from larger and more accessible economies. Therefore, as several of the case studies indicate, particularly from Samoa and Tonga, a critical issue in successfully competing in the export market is for them to identify and fill a niche market. That niche market may take a number of forms, for example: producing for a narrow time window when the product is not available from other countries (e.g., squash for Japan in November/December); producing a unique traditional product (e.g., fine woven mats from Samoa); catering to Pacific Islanders and others living overseas (e.g. root crops and kava); producing

[3] Honey for Samoa also has a domestic and international market.

high value products that may be certified and attract a price premium (e.g., virgin coconut oil from Samoa and vanilla from Tonga); and potentially providing a product in a form that is not likely to be readily duplicated in the importing country (e.g., frozen kumala chips in New Zealand).

Catalytic roles and effective partnerships between those involved in making the export market operate efficiently become critically important.

The case studies (e.g., fine mat weaving, bee keeping, organic farming, and virgin coconut oil) involving the woman based NGO in Samoa (Women in Business Development Incorporated (WIBDI)) provide admirable examples of just how effective such types of organisations can be in identifying income generating opportunities, accessing information and relevant technologies, training and nurturing small farmers and the disadvantaged, developing partnerships with the public and private sectors, establishing processing and marketing systems and channels, and in helping create situations ensuring that benefits accrue to people (e.g., farming families) in rural settings in a manner that is sustainable in the long run. Such organisations are close to the people, can be flexible in what they do and stay committed for a long time.

The case studies illustrate a number of ways governments need to be and can be involved in the export market. Given the sensitivity concerning keeping out pest and diseases in importing countries, regulatory functions in the form of quarantine inspection are important for many products (e.g., root crops in Tonga) while certification, licensing and registration, and grading functions are sometimes important. Farmers and exporters' perceptions about governmental functions vary according to crop. In general probably most feel the less government is involved the better. However, most feel that government has facilitated the development of a viable and robust vanilla industry in Tonga but are much less positive about its role in regulating the supply and quality of squash that is exported to Japan. Such control of the squash industry was a matter of necessity but it does not help in overcoming resentment on the part of some.

Indeed the squash industry as an export industry has been a mixed blessing. In addition to the environmental problems mentioned earlier there has been a degree of concentration of the industry in the hands of larger farmers with some of the exporters engaging in the production of squash. Thus benefits of the squash industry for small farmers have become less over time, and the industry is concentrated on two of the

main island groups. However benefits have accrued to other agricultural enterprises and exports in the sense that equipment and infrastructure initially developed for the squash industry is now available for use in other agricultural enterprises. The vanilla and root crop export markets have appeared to result in benefits being distributed more equitably throughout Tonga and have continued to accrue to small farmers, over time. All these export markets have provided employment and income opportunities to many beyond the farm level. However the squash export industry has been less beneficial than the other export markets in terms of net export earnings because of the need to use high levels of imported inputs.

An interesting point that arises out of the kumala chip case study, is that large commercial farms with processing facilities, have the potential of working with small farmers under contract farming arrangements to produce and purchase quality fresh kumala. Then after processing on the "nuclear" farm they can be exported by the commercial farmer who has established a marketing export channel.

Two additional points relating to the above case study and several other case studies are the potential benefits of processing export products in some way, not only as a means of eliminating potential quarantine problems (e.g., weevils in the case of fresh kumula), but increasing the value per unit weight (i.e., an important means of controlling transportation/freighting costs), and capturing value added activities in the PICs themselves, therefore creating additional employment opportunities. In fact identifying new types of value added activities provides potential for developing new niche markets.

Conclusion

The case studies collectively indicate that commercialisation of small farmer's agriculture is taking place in the PICs. We have indicated some of, but by no means all, the generalisations that can be drawn from them. Reading them in detail will highlight others.[4] Also we recognise other lessons can be drawn from experiences not documented in the case studies. We have not attempted to include any of those. However, as commercialisation proceeds the need for small farmers to develop analytical skills will become critically important if they are going to flourish in the market place. As three of the case studies emphasise

[4] For example, for a number of reasons exporters often find it less risky and more reliable to deal with commercial importers. Also the strength of that relationship over time is built up as a result of honesty, hard work and being able to deliver quality products in sufficient quantities in a timely manner.

(i.e., one from Samoa and two from Fiji) such skills will be critically important in farmers being able to objectively determine whether it will be wise to apply for loans and to determine whether producing specific products will result in a profit when they come to market them.

2. Solomon Islands

Local Produce For Village Markets

By
Tony Jansen, Kastom Gaden Association, Solomon Islands

Summary

This is the story of Maeda Qilanokoso and her life with respect to agriculture in her home village of Sasamuqa in South Choiseul. Her husband in the early part of their married life developed a coconut plantation but the later collapse of the copra market lead to them largely falling into disuse. Therefore her critically important and major reliable source of income has been growing crops in mixed food gardens and selling some of them in the village market. Earlier produce sold was mainly root crops but now there is a market for more types of foods plus cooked food. Maeda's story, which spans three generations, illustrates the remarkable resilience and resourcefulness of many people in the Pacific Island Countries (PICs) in dealing with adversities and hardships as they adapt their lives to changes around them. She has: seen the local market develop; watched more money circulating; and learnt to grow new crops and new methods of growing them (e.g., mulching and composting) so that she can make more intensive use of land closer to her home — which is important as she gets older and walking long distances is a problem. She also now sells a broader range of market products to respond to local demand. Although now elderly, Maeda is still fully involved in the affairs of her family (i.e., children and grandchildren) in helping to provide healthy food for her family, contributing to meeting social obligations and helping to fund and save fees for schooling her grandchildren.

Background

This case study is about a woman named Maeda Qilanokoso who has been a small scale farmer for most of her life. Maeda was born at Sasamuqa Hospital in 1935 (May 15th) in the same village where she lives today, Sasamuqa in South Choiseul, Choiseul Province, Solomon Islands. Maeda is a village farmer typical of many older rural women in Solomon Islands. She has been a committed and successful small market gardener and producer of food for her family and other important social obligations for most of her life.

In her youth Maeda went as far as standard 5 (fifth class) at Sasamuqa primary school. She wanted to go to standard six but due to cultural restrictions girls could not leave the village at that time and the school in Sasamuqa only went as far as standard five. At that time girls were given a low priority in education. So she left the school and concentrated on working with her family in growing food. She was educated in traditional knowledge from her parents and grandparents.

In 1954, when she was 18, her parents arranged for her marriage. This was a common cultural practice at that time and she had no choice but to follow her families wishes.

So Maeda was married to Ronnie Bosevolomo. Ronnie is from Mamarana, a village in a distant part of the island.

Ronnie's father came to Sasamuqa as a captured slave when he was young. This was during pre-Christian times when tribal raids and warfare between tribes were still common. Ronnie's father married and Ronnie was born in Sasamuqa. Their family stayed on in the village when '*lotu*', the Methodist Church, first came to the island of Choiseul at Sasamuqa. With conversion to Christianity by local people, Ronnie's father became a free person and was given land by local landowners and a future in Sasamuqa. The Church established a mission head quarters in at Sasamuqa that would set Sasamuqa apart from other villages and help it to become a micro centre of development in the rural areas of Choiseul for the next almost fifty years.

Growing Food for the Family and the Market

After Maeda and Ronnie were married they had many food gardens that they cleared in the forest following the traditional method of shifting cultivation. Gardens are cleared in the bush and then cultivated for 1-3 crops. After cropping the garden is left to '*piara*' , a Babatana language term for various stages of ecological succession then develop until a mature rain forest has re established itself. Many wild useful plants including vegetables, yams, fibres, medicines and building materials are collected from piara. In recent times in Sasamuqa the fallow period – how long the bush is left to *piara* has declined. Families will have some short fallow gardens very close to the village and other long fallow gardens on the distant ridge tops. The long fallow areas far from the village are seen as the most fertile and productive. But the distance involves a lot of work carrying produce back to the village and time spent walking to and from the garden. This can lead to poor family

nutrition as women are forced to spend long periods travelling to and from and working in distant bush garden and cannot care for young children.

Maeda and Ronnie also planted coconut plantations that were being promoted by the colonial government and they made copra to earn money along with many other people in Choiseul at the time. They also raised pigs. At that time their main sources of income were: coconut (copra), selling root crops in the market, and selling pigs. Over the following years Maeda and Ronnie had eight children - 4 boys and 4 girls.

Maeda has been selling produce in local village markets ever since she was married. It has been a stable and important source of income for her and her family for over fifty years. While Ronnie, Maeda and her children did work together on the copra when Ronnie was still alive, selling in the local market has always been Maeda's responsibility and she has always managed the money herself that she earned in the village market.

In 1974 a road was built linking Sasamuqa with a string of nearby villages along about 20-30km of coastline. The road did not actually connect to any urban centre but it did allow for easier access for people to get between villages and made it easier for people to come to the hospital, school and mission centre at Sasamuqa. People were transported along the road by a mission tractor that operated like a bus with a trailer on the back. As a result of the road people started to make more gardens in the bush. At that time the money you could earn was very low but you could buy a lot with only a little bit of money. People sold big piles of produce in the market even though the price was very low. *'It might only cost 10c but we sold big heaps (of produce). '*

The road opened up more movement of people and produce and the village markets grew in size. Maeda found that selling in the market at this time was good. Even though she did not earn that much the buying power from the money was good and she was able to buy the things she needed for her family. During and up until the 1970s she only sold root crops in the market: kumara (sweet potato) , tapioca, banana, pana (dioscorea alata), yam (dioscorea esculenta) , taro (colocasia esculenta). Sweet potato had become the main food crop for most of the people in Sasamuqa at that time and this continues to be the situation today. At one stage the market moved to another nearby village (Vavudu) but then it moved back to Tagaza (a part of Sasamuqa) where is has stayed until the present time.

Maeda has always sold her produce only in the local area. She sells in the local market or at the door step of her house. At this time (in 2003), Maeda markets a little bit of every thing she has in her garden including: banana, cut nut (barringtonia sp.), taro, kumara, cassava, vegetables from her sup sup garden (a type of kitchen garden), coconut, and betel nut and leaf. This time the market has lots of different types of produce and even cooked food for sale. There has been a steady change in the market from the 1980's to the present with people interested in more varieties of plants and also in cooked food. Maeda remarked that the produce gets a good price but the price in the store is also very high and she feels that her buying power has actually gone down compared to the past.

When Maeda and Ronnie had a young family with young children they used the income they earned for school fees, soap and kerosene. Clothing for the family was also paid for at that time from income from market. School fees were paid from selling copra from the family plantation that they had planted. All their children went to primary school. Two went on to secondary school. All their children are now married and Maeda has many grandchildren.

Ronnie passed away in the early 1990's. In her old age Maeda finds herself more or less on her own and having to support herself financially. This time her only income is from marketing of produce. She still uses the income from marketing for her basic needs such as kerosene, soap, and salt. When she goes to market she often sells fish caught by her son. The family no longer sells copra since the collapse of the Solomon Islands Commodities Export Marketing Authority (CEMA) in the late 1990's.

Box 1: Income from Selling in Local Village Markets

- If she has lots of things to market she might earn $70 for one month.
- If not so much is taken to market it might be $20-$30 for one month.
- There are no cash expenses
- Non cash expenses are only labour

Growing for Market

The same garden is used for growing food for herself, sharing with her family and for market. If there is surplus then it goes to the market. If there is less then it goes to the house as the first priority. But sometimes she will take the better looking produce to the market. If there is not enough to eat in the house then she will have to leave it.

Sometimes she reserves food for market but then her grandchildren or others come to visit so she gives them food and then she does not have anything left for the market. This is a problem for her sometimes. She has a lot of grandchildren. So when they come she wants to give them food but this effects her income. But this social sharing is also very important to their way of life so she accepts that this is necessary and she tries to keep some food in the house to give to her grandchildren when they come.

Box 2: Prices in the Sasamuqa Market in 2003:

Sisu (kumara): one 20 kg bag for $20

Vegetables – one 'parcel' (a bundle wrapped in a leaf) is $2

Corn is $1 for one big corn cob (she selects the big ones for market)

Coconut – 50 cents for a green coconut for drinking

Beans: $2 for one bundle.

Banana: depends on size: can be 10cents for one – big ones can be 20cents for one (eg cooking bananas)

Cut nut (vele): depends on size – 4 for 10cents or 3 for ten cents

Betel nut: depends on time: 10-20cents depending on size.

Sarapa (leaf for betel nut): 5 leaf for 10cents, or 4 for big leaves for ten cents

Susuri: (Pitpit) in season she sells 12 for $2

Qiqiti: sells them cooked: 5 for ten cents.

Kakake: she sells cooked – split in half and cook in motu with coconut milk. 50cents for one.

Tapioko – sometimes she cooks it and sells it for one dollar for one piece – baked. Rolla for one dollar for one.

Kuate and sisu for $2 for one parcel – baked in motu.

Cut nut, betel nut and leaf are the most profitable things Maeda sells. She does not even need to take them to the market – people will come at night to her house to buy betel nut and leaf.

Maeda has planted lots of cut nut trees between the coconuts inside her coconut plantation a a type of diversification. So she has a lot of them. They are also planted all around her house. They have more than they need at home for sharing with the family so there is plenty for market which is a good income earner for her.

Copra

No one in the family is making copra these days from their family coconut plantation. Before, after her husband died, her children continued to make copra for her. This time there is no buyer for copra. There has been no buyer for copra since before 2000 when CEMA stopped buying copra. This has really reduced her family income and she now has to rely on marketing to also help pay for school fees for her grandchildren. This is because her children should have been making copra like she did when she was a young family but they cannot. She worries how they are going to earn enough money in the future.

Maeda diversified her coconut plantation by filling it with cut nut trees that now provide an important source of income. The cut nut grows well under the shade of the coconuts.

Pigs

Like most families in Sasamuqa Maeda also raises a few pigs. She usually has one or two at a time. They are bought as piglets from local farmers for $50-$170 each depending on the size and breed and then sold for about $800. They have recently moved their pigs to the sea side from the bush following a trend in the village. One of the practical reasons being that sea water can be used to wash the pens. This is an important source of income for her family. Maeda and her children feed the pigs every day with garden food and leftover food from the house.

Three Generations of Market Gardeners

Her grandchildren now help each other with marketing. Maeda with her children work together to help to pay school fees for the grandchildren. There are currently five grandchildren that she is helping to pay the school fees for. The family has a plan. They choose certain days to

market to earn money for school fees. On that day they all (Maeda and some of her children and grandchildren) all take produce together to the market with all the income earned used for school fees. If they all market together they can make $100 in one day. The market for school fees is in addition to the usual marketing she does.

They have a family budget for school fees. They put money aside for school fees.

The money they save up for school fees is kept by Maeda. Everyone trusts her to keep the money well. They would not trust some younger family members in the same way. She will not let people take the money for other purposes. Sometimes family members ask Maeda for some of the saved money for other purpose but she will not give money to them. Even the community keeps some of the church funds with her.

One grandchild is at Tarekukure Provincial Secondary School, and another one at Goldie College (A national church secondary school) but she recently had to come back to Sasamuqa. Maeda was not sure what the school fee is - the parents of each grandchild are the ones who pay.

Market Customers

Nurses, teachers, and people in the village all buy Maeda's produce in the Sasamuqa market. There is a hospital, and a secondary school in Sasamuqa, all with paid workers, which helps to bring more money into the local market.

In recent years Maeda has noticed that even people who do not work still buy regularly in the market. This is a change from many years ago. So it seems to her that money goes around in the market/village. Even people who do not have paid jobs are buying in the market because they also sell things so they have some money of their own.

But in the 1970s and before only old people or those who worked had money to buy. But now even small children and adults have money to buy in the market. This has been a big change to her.

Another big change in the market is that before people only bought the normal garden produce that was there. This time people like things like taro and custom pudding but there is not much of it available. The children like things like ring cakes, things made from flour. But adults like older traditional foods and betel nut and leaf.

Maeda sometimes cooks cassava pudding and other cooked food to sell in the market. When it is in season she cooks a wild fruit called Qiqiti (polynesian chestnut). This is popular in the market and provides another option for her to sell when the tree has fruit.

Maedas Gardens Today

At this time Maeda has two garden areas she is using. One is in an old coconut plantation. She put the garden there because she is too old to walk far away. She finds it grows well once the coconut roots start to rot. She uses mulching sometimes and finds it works well but also burns sometimes. People steal her pineapples so she stopped growing them. The young men in the village steal the pineapples to make *kwaso*, a local alcoholic home brew. She continues with growing betel nut even though people also steal them. So she made her garden close to her betel nut palms so she could keep an eye on them.

Now that she is old she cannot work in the same way as she did when she was younger but she it still determined to keep making her gardens.

She has noticed many changes in the way people make their gardens now compared to before. In the past people had big gardens. They did not use chainsaws to cut down trees in the garden area like they are now. They used to make '*rua*', a technique of standing up sticks to stand up on top to cut the tree.

'People do not work hard like before. People do not work in sakapa (the old primary forest where the soil is most fertile. In the future it looks like they will be weak – they work in piara (small bush fallow) and they will have to survive with that. They have not got used to working in the big forest so they will garden in a different way.'

Help from Outside

A local non government organisation (NGO), Kastom Gaden Association, helped with training Maeda how to make a 'sup sup garden' to grow food close to the house in the late 1990's. Maeda continues with these methods to this day. As a widow and as she gets older she finds it a burden to go the bush and has found it easier to use mulch and compost to grow more and more food around the village.

The local department of agriculture gave her tools to help her as a committed farmer when she experimented with upland rice. They gave her a bush knife, hoe, plastic tent, and net for making rice. All of this

was supposed to be to help with rice. But she uses the tools in her food and market garden. They also gave her fertiliser. The fertiliser was put on her garden as a demonstration run by the agriculture extension. She never used it again. The left over fertiliser is still sitting in her house after many years.

She grew rice a number of times and harvested 4 bags. She shared the bags. She stopped growing rice because she did not have anyone to help her.

'Rice is harder work than kumara.'

Especially drying and milling are hard. The growing is all right. She got tired of carrying the rice out in the sun every day and then putting it back at the end of each day. She found that rice is not suitable for one person to do on their own. But with sweet potato you just clean it and plant and then it is ready to eat.

Maeda is a member of the Planting Material Network (PMN). She has received seeds sometimes when it is sent to her but never ordered seed – did not understand that this was possible. (PMN members are entitled to order seeds from the network) She does not read the newsletter as she cannot read English but she shares it with her family. She is still growing some of the varieties of beans that came from the PMN.

Conclusion

For Maeda and her family, growing produce from mixed family food gardens and selling some of that produce in the local village market has been a critical source of income for basic family needs and schools fees since the 1960's up until the present and also provided the family with healthy food that has been shared to meet social obligations. Local markets have been a stable and reliable source of income while the copra market and the wider national economy has gone up and down. It has been hard in her old age to support herself and her many grandchildren but Maeda is a proud village farmer who has successfully supported her family who now span three generations. She has successfully coped with change, learning to grow new crops and new methods to make better use of land closer to her home and diversified her market products to respond to local demand.

Taro Farmers Group

By
Tony Jansen, Kastom Gaden Association, Solomon Islands

Summary

Johnson and Rachael Ladota and their family are taro farmers and live in Masiliana village in the difficult highland interior of Northern Malaita. Taro provides their main source of cash income. The case study illustrates the advantages of farmers cooperating with each other when it comes to marketing. They cooperate with each other in carrying the taro on the bush track to the road for onward transportation to the market. However the activities of the farmers' group goes well beyond that. They have developed their own local markets through developing their own market spaces and stimulating the ordering of taro for traditional purposes in coastal villages where, because of population pressure, it is no longer possible to grow taro on a large scale. Finally they control the supply of taro on the market in order to keep the price of taro high enough for the benefit of the farmers themselves and to justify the labour intensive nature of taro production. The farmer group now markets taro as far away as Honiara. Johnson and Rachael have played a major leadership role in suggesting and helping implement these important marketing strategies and beneficiaries have even included taro farmers in a nearby village, Fa'adila. The case study also demonstrates a characteristic of the Pacific Way of Life, namely the idea of sharing and caring for the good of the community.

Background

This case study is the story of Johnson and Rachael Ladota and their family, taro farmers from the island of Malaita in Solomon Islands. The Ladota family have nine children with four of them currently in school. Johnson was born in 1954 and Rachael in 1967.

Johnson and Rachael's home is a place called Masilana village, located in the 'highlands', the rugged interior of North Malaita, Malaita Province, Solomon Islands. The village is made up of one clan and consists of twelve households with 56 adults registered on the electoral role in 2000 and many more children. Masilana is located on a ridge top with steep valleys on all sides at about 600 metres elevation resulting in a cooler climate than the tropical lowlands on the coast. The village is five hours walk on muddy and slippery bush tracks from the coast and the

nearest road which runs along the coast of North Malaita from the provincial centre Auki.

The village are followers of the South Seas Evangelical Church (SSEC) which is a common church in this part of Malaita. Having one common church and the ties of their tribe unites them. This has made this small village a strong cohesive group for decision making. They have not been effected by the same kinds of community disputes as many coastal villages in North Malaita.

The re-settlement of Masilana village was initiated by Johnson Ladota's father. Their family had previously moved to the coastal lowlands, a common pattern of migration from the highlands. On the coast they asked relatives for land for gardens and built their homes in the larger coastal villages centred around the village church. Under the customary land tenure system this land was provided under local tradition which allows for landowners to provide access to land for gardens for people who settled in the area but were not primary landowners.

The attraction of coastal living was mostly to do with access by road and sea to urban centres and markets and the availability of local services, most importantly schools and clinics. Life in the highland areas such as Masilana is hard by comparison and involves lots of walking, carrying of heavy loads and limited opportunities.

But as the population grew land became scarce on the coast and resentment grew of the high landers presence and use of limited land. Where people were making large market gardens this often made the tension even worse as the landowners resented the settlers making money from 'their' resources. One day Johnson's father found that one of their gardens had a crossed stick placed on the path that led to the garden – a traditional sign that the landowners had closed that area to their access and they were no longer able to use it. Later one of their pigs was found with a knife wound, another traditional sign that they were not welcome. They realised they should return to the large area of land that their tribe owned in the middle of the island in the highlands and try to develop it. They could see they did not have a future living on other peoples land. So they returned and built the village of Masilana where they maintain a semi subsistence way of life.

Taro Production

Malaita has been a traditional area for the production of taro (*colocasia esculenta*) most probably for thousands of years. Taro has been an important crop for food security and for cultural purposes since antiquity. In recent decades it has become increasingly difficult to grow taro in the coastal lowlands due to the lack of soil fertility and the proximity of gardens to each other. Both of these problems being a result of population growth and other land use pressures such as the occupation of large areas of coastal land by coconut plantations. Traditionally taro is grown in a 'long fallow' where bush is 15-20 years old before being cleared again for taro cultivation.

When taro gardens are too close to each taro virus's such as leaf blight, *alomae* and *bobone* (local names for two taro virus's found on Malaita) can cause reduction in yields and in the case of *alomae* total destruction of the crop. These virus are spread by small insects called plant hoppers from one infected taro plant to another. This can be devastating for taro farmers and has made growing of taro much higher risk than other crops. Another major pest problem is the taro beetle which eats holes into the taro corm causing the corm to rot. The beetle again can move from garden to garden where fallow periods are not long enough.

As a result of these problems mentioned above and the high risk of taro cultivation, coastal farmers have largely shifted to sweet potato and cassava as their staple crops for the family and for market. But there remains a high demand for taro among rural and urban consumers even though in many cases their farming systems are no longer able to produce taro very successfully in the traditional way. Taro is considered the best tasting root crop and is needed in many traditional feasts and events. Growing and consuming taro is a high status activity in the traditional culture and this high value and status of taro continues today.

In the highlands of North Malaita there is more land, hence longer bush fallows and higher soil fertility. So taro production is possible and the local knowledge exists among the farmers to grow taro and manage some of the pest and disease problems mentioned above. Farmers use complex indigenous knowledge to reduce the threat of *alomae* and *bobone,* for example: careful management of taro planting materials, restrictions on entry by other people to taro gardens, use of botanical plant based sprays, and repellent or protector plants that are believed to reduce the threat of *alomae*.

Growing Yaro as a Cash Crop

In 1986 the people of Masilana agreed that they would no longer keep pigs or chickens in their village even though this had been a traditional source of income and wealth. Johnson, as a respected leader, had convinced people to make this decision because pigs were not fenced in the past which had forced people to fence their gardens. Large timber fences were made from cut trees involving a lot of labour and materials. The fences needed a lot of maintenance. This was becoming very difficult and disputes over damage by pigs to gardens were increasing. It was also a concern for health reasons to have the pigs roaming around the village untethered.

Johnson proposed to the community that they concentrate on taro as an alternative source of income for the community. They formed up a farmers group consisting of five families in the village. They formed a committee to make decisions. The aim was to concentrate on the growing of taro for income generation. Those five families remain in the taro production group today. The families come from two villages – Masilana and nearby Fine Water.

The first step in joining the group was that each family had to plant a lot of taro in their mixed family food gardens. When they had enough taro for all their family needs then they began to look at developing markets in the local area and in urban centres for their taro.

As a first step Johnson contacted people on the sea side villages to sell taro to them. The arrangement was that people on the sea side would exchange their traditional shell money called *tafuliae* for taro. One *tafuliae* (or one *red money,* the local Solomon pidgin name for one 6 foot string of traditional shell money) has a local value of 400-500 taros.

Tafuliae, a traditional form of money, is used for payment of bride price, traditional compensation and land issues. It can be used as a form of local currency and is used to purchase many things such as pigs, taro, yams, and even chainsaws. It can also be exchanged for cash. The cash value varies from place to place and between rural and urban areas.

The taro from Masilana village was sold regularly to coastal people for use in feasts for weddings and special events like the opening of churches, or the traditional 'cementing' of graves of family members who had recently died. These types of events usually occur during November and December when relatives from the capital Honiara return home to the villages at Christmas time and the whole tribe is together.

Urban members of the tribe often sponsor such events with the cash they have earned from paid employment. Taro is needed for these feasts as it has important traditional values. A feast would not be considered complete or adequate without some taro. So there was high demand for the taro from the highlands as the coastal people could not produce enough on their own.

To respond to this demand for taro for traditional feasts, Johnson promoted a taro order service in the coastal communities. He would walk down to coastal villages and take orders from families for taro. Two 50 kg bags of taro, a typical order, would contain about 400 small to medium size taros. The farmers would usually fill the bags with small to medium taros to maximise the number of taro in the bags (as the tafuliae is based on a customary number of taros and not the size). They use recycled bags used by Goodman Fielders company for mill run. The cost of the two bags containing 400 taros is one *tafuliae*. This price is set by tradition although the number of taros can vary a little bit depending on supply.

The families in the taro growers group in Masilana and Fine Water villages began to accumulate a lot of *tafuliae* from their taro marketing efforts. The families in the group used the red money for bride price payment when their sons and relatives were married, 'custom' and other traditional exchanges. When the families had enough red money for all these family needs for traditional money they moved on to using the shell money for other needs. Johnson used *tafuliae* to buy a chainsaw (the transaction also included some cash). They could also buy pigs with shell money with one pig costing one *tafuliae.* Some people also exchanged red money for cash - $500 (6 feet red money), 7feet – $600, 8 feet up to $1000.

In 1994, after 8 years of selling in the coastal areas of North Malaita the group started to sell in Honiara. When they started this new level of commercialisation the group met more often. They decided that if anyone in the group has taro to market in Honiara then everyone in the group must help carry the taro down the bush track to the road for that family. The marketing of taro in Honiara market was intentionally limited to one person/family each week. Each week a different family took taro to market in Honiara. Everyone in the taro producers group carried bags of taro for that person/family to the sea side. Usually they would take 3-5 bags in one week. Each person/family would then take the taro to market and sell it themselves. They also started to sell in Auki, the provincial capital, using a similar system.

For example last week John from Fine Water village sold 4 bags of taro in Honiara. The boys from all the families helped carry the bags down in the night to get the taro to the road in time to catch the truck. If no one in the group goes to market then they leave it open for anyone else in nearby Fa'adila village who grows taro (but is not a member of their group). They have an agreement with the local communities that if any member of the taro producers group is going to market then no one else goes from other villages. They do this to try and limit supply to the market and keep the price high. So far this has been very successful and even through times of economic down turn the price of taro has remained high and buyers are still there in the market looking for Malaita taro. If the price of taro went down it would not be worthwhile for them to go to Honiara.

They had found in the past that if 4 or 5 five people go to the market in Honiara then they cannot sell every taro within a week. If they spend more than one week then the taro goes bad. If more than five people go to sell then they will complain about the price going down when they hurry to sell the taro quickly before it rots. Johnson does sometimes lower the price of the taro in this situation in order to sell it quickly and go home but other farmers can resent this and put social pressure to keep the price high.

Before the *'ethnic tension'* (the civil unrest that started in 1999) the cost for taro was $1-$3 for one taro corm depending on size and quality. Sometimes it might go up to $4-$5 for a big taro when demand is high. During the ethnic tension the expense of trucks and ships has gone up considerably. But despite the economic downturn, the price for taro has stayed the same in Honiara (but it did not go up to compensate for the increased transport costs so their income has gone down). This made some people decide to just go to Auki to sell as their profit had been reduced in Honiara. Some farmers, including Johnson and Rachael have also diversified and grow other vegetables to sell in the market. Sometimes this can slow down their taro production but it also protects them from changes in the price and demand for taro.

When Johnson and Rachael go to the Honiara market they usually earn between $600 and $800. They will stay with their relatives, known as their *wantoks*. They will always share some taro with their *wantoks* in Honiara. This is a system of mutual obligation – their wantoks provide accommodation for them and they bring taro from Malaita for their hosts. Before any member of the group goes to Honiara they usually save

about $300 in expenses money to cover their costs for the journey. Johnson and Rachael also usually take other vegetable crops to the market in Honiara at the same time. Johnson finds that people from Western province like to buy taro from Malaita.

Box 2.3: Taro Marketing Costs

Johnson and Rachael usually take 3-5 bags of taro to the market in Honiara

Selling taro in Honiara example:

Income

One bag of taro at $1 each (200 small taros in the bag) value is $200
Another at $2 each, (150 medium taros in the bag) value is $300
Another at $3 each, (100 small taros in the bag) value is $300
Total income from sale at the market is $800 and over.

Expenses

Labour growing taro: they sometimes spend $60 on group to clear and prepare garden for planting.

Transport and freight:

Truck to Auki freight is $10 for one bag = $30
Ship to Honiara freight is $15 on Sa'alia ship = $45
$10-15 to the market in a taxi for all the bags.
Total Freight costs: $90 transport

Fare for person selling taro: Sa'alia ship to Honiara – $60 one way, truck to Auki: $15 one way . Total fares for one person return: $150
Expenses in town while selling taro: about $50 for food

Total Expenses: $290 (if one person goes, for two it would be $440)

Auki Market: $10 for one heap of taro. 6-10 taros in one heap depending on size of taros.

Spending the Money Earned from Taro Marketing

In order to encourage the wider distribution in the village of income from selling taro every family in the group started a canteen or small village store to sell store foods and goods like tinned fish, soap, and kerosene. While families were selling in Honiara there was plenty of money in circulation in the village and so people would buy products from the local stores rather than carry them up themselves. But with the economic downturn most of the canteens have stopped operating. There is not enough cash circulating with farmers mostly selling in the local markets. All they will buy now is soap and essential items so many of the canteens have closed.

Some of the money from selling taro will be used to buy a few bags of rice that are taken back to the village. Most people do not spend much on clothing – only when they have earned a lot. Mostly the weekly taro sales in local markets are used for family essentials like soap, kerosene, and some other foods from the store.

Johnson and Rachael have at times saved up their income from taro marketing to buy more expensive goods to make long term improvements to their life. For example they bought roofing iron for their house in Auki, a chainsaw in Honiara, bought materials for farming (a pump, tools, esky for taking vegetables such as broccoli to the sea side). They also use the income from taro for school fees for their children and to contribute to building a big new church in the community. They have four children in primary school which costs $480 per year for all of them.

'When we have money we are happy to stay at home in the highlands and don't want to go anywhere else. It does not matter that we are isolated and far away in the bush, we are happy here. '

When they go to market they buy rice and kerosene for fuel for lighting all the time.

Taro Growing Cycle

Usually one group of youths from the church is organised for brushing and heavy work of clearing in the garden. This is usually charged at $50. The money goes to the church. Johnson usually uses the youth group for clearing although some families do the clearing themself. If they do not use the group then Rachael will clear and burn the garden ready for planting. The family does the planting, weeding and harvesting. They plan and organise the family to grow taro. Rachael does most of

the work in the taro garden although Johnson sometimes does the planting of the taro. The first weeding is done by Rachael after three months and then a second weeding after another three months. Harvesting and then preparing the taro tops and suckers for replanting is Rachael and her daughter's work.

Johnson concentrates more on the vegetables, while their older sons Chris and James do different things such as a recent return to raising pigs in a fenced area. Men and women carry down the taro to the road. But sometimes women carry more. Johnson is the one who goes to Honiara to sell the taro. Sometimes his wife might go him to do some shopping for the family and stay with her sisters. Rachael usually does the marketing of taro in Auki.

Rachael keeps and maintains the different taro varieties. They make some blocks of popular types for the market and the family, then the rest are mixed in the garden. If she finds a good taro in another garden she brings it back and tries it in her garden. There are some types that they are growing now that she has collected. When bringing taro they must ask the farmer for the name. Taro always follow traditional name. Johnson and Rachael have one variety of taro that has been in Johnson's family for seventeen generations. They do not sell this taro in the market.

In the garden there is one area for market. Good taros go to market. Small ones and damaged taros are for the family to eat. If the garden is close to finished harvesting then they keep all the remaining taro for their family.

Local Markets

When selling in the local area the farmer group found it very hard work to go to the market at Takwa on the sea side as it could take them up to five hours walk to get there with heavy loads. Johnson and the farmer group decided to organise a market area at Fa'adila and encourage the coastal people to come and buy taro there at a lower price. This has been very successful. Some of the coastal people were willing to come and buy the taro from the bush villages. Some middle men also come and buy taro at Fa'adila and then sell it at a higher price in Takwa.

'Now that there is market at Fa'adila we sell there – this has been going for two years. Since before we have always gone down to the sea side. People on the coast now come up to the market. They carry up fish to the market. This is a real improvement to our lives.'

Prices in the Fa'adila market: heap of 5- 7 big taros is ten dollars. The people who buy them in the bush market can then go and sell them in the sea side for a profit. The market is held every Saturday and Thursday. The people who come to buy taro in Fa'adila can then sell the taro again on Friday at a big market in Takwa. Men and women come to the market to buy and sell. Before the ethnic tension it would costs $20 for a heap of taro on the sea side market that costs only ten dollars in Fa'adila. Now they have to either sell a bigger heap of taro or reduce the price. These days with little money around, people often cut down the price to $5-$6 at Fa'adila and then sell in Takwa for $10.

The nearest clinic to Masilana is at Fa'adila and the nearest school so people from Masilana are walking there every day. It takes about one hour on a gentle track along the ridge. This makes the Fa'adila market popular and is easy access. Farmers can carry their own taro there.

Folotana market is located on the other sea coast in a different direction from Takwa. The price of fish at Folotana is lower than the price on the Takwa side but it is easier to get to taking about 3 hours on a steep and muddy bush track. So the people of Masilana decided to make a market at Folotana village. They negotiated with the community and a built a market area by the road side. The price of fish is $10-15 for bonito. Taro is $6-$10 a heap. Market at Folotana is on Saturday.

Folotana on the coast: 20kg – when people were selling cocoa they have more money to buy. Now we would sell a 20kg bag for $20. This would be 3-4 heaps at $5 for one heap. The prices in the market depends on the income of people. When people in Folotana are selling a lot of cocoa then they have plenty of cash to buy taro. Highlands people try to organise supply to the market so the amount of taro and the price do not change very much. The main factor that changes is demand which depends on the income. On the sea side the people earn money from fishing, copra, and cocoa. People from Masilana often use the taro income to buy fish.

Mostly Rachael takes taro to Fa'adila and Folotana. The children in the family help to carry. They have five children in the village who are old enough to help carry and work in the garden. She also takes a bag or two to Auki and sell taro there. The income is used to buy rice, salt and kerosene. If she sells two bags she might also buy some clothes for the family from the money earned. Things like tinned fish and noodle are bought from the village canteen with the cash she carries home. She goes to at least one of these markets every week.

Conclusion

Taro marketing is the main source of income for Johnson and Rachael and their family. They have successfully developed a farmers group that pools labour resources for transport on the bush track to the road and tries to control supply to keep the price of taro high enough in the market to cover the high labour cost for taro production. The farmers group has developed its own local markets, both physical market spaces and also by promoting the ordering of taro for traditional purposes in coastal villages where taro is no longer grown on a large scale.

Growing Water Cress for Urban Markets

By
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Summary

The location of this case study is an area called LDA (Livestock Development Authority) on Guadalcanal, only about 20kms from a major urban centre, Honiara, the capital of the Solomon Islands. Prior to the ethnic tensions, in the early to mid 1990s, some men and women farmers started to grow water cress in a small river close to the village. They identified a large potential market demand in Honiara and came up with an innovative way of expanding production and overcoming a problem of planted water cress being washed away during river flooding. This technology, involving planting water cress on a floating wooden base, proved very successful. Production expanded and families by negotiation divided the river into areas so more could benefit. Water cress then became an important cash crop for many families. Then problems started arising as a result of the increased production. Pest problems in the form of a caterpillar (i.e., the diamond back moth) started building up. Innovative ideas involving spraying worked for a period but eventually became less effective. During the ethnic tension period, when the cash incomes of farmers diminished, less processed store foods could be bought and some women commented that their children became healthier as a result of returning to more traditional diets. This highlights another problem – improved cash income can have an adverse impact on diets – if people are not taught about what makes up a healthy diets. This case illustrates the innovative and entrepreneurial potential of PIC farmers even in the absence of support from outsiders (i.e., agricultural extension and NGOs). However, it also illustrates the potential benefit of partnerships between tapping the potential skills and knowledge of farmers and the knowledge of outsiders (e.g., the PestNet network) that is currently trying to help identify a way of controlling the diamond back moth problem.

Background

This case study is about the experiences of farmers living in small rural settlements in the area called LDA located less than 20kms from the centre of Honiara, the capital of Solomon Islands. The LDA area is on customary land of the local Guadalcanal people. The people in LDA

area grow many different vegetables and root crops to sell in the main urban market in Honiara as well as food for their family needs. Due to their closeness to the largest urban centre in the Solomon Islands farmers in this area are heavily focussed on small scale commercial agriculture. The name LDA is named after the Livestock Development Authority, part of a largely failed government program to promote cattle farming in the country, which used to have a farm and abattoir located in this area. The LDA program collapsed many years ago. During the recent civil unrest known as the 'ethnic tension' local people moved into the old LDA workers quarters and took back their traditional lands where the LDA farm and facilities were located.

Much of the land close to the coast in this area is covered in imperata grass land. The flat land generally has good, fertile soil but the sloping areas are often more eroded and degraded. During the annual dry season fire is a problem along with water. During this time farmers move down close to the rivers or further up into the forest where there is more moisture. Farmers practice shifting cultivation where the bush or grass is cleared, burnt and planted to a mixture of root crops and vegetables. Gardens are usually mixed and used for family consumption as well as marketing. In general grass land is used under short fallows of 1-4 years while more distant secondary forest areas are under longer fallows.

Farmers in this area had been more commercially focussed prior to the ethnic tensions being very close to the capital Honiara. Many farmers were using fertilisers and pesticides on a regular basis which is very different to farmers in more isolated rural areas of Solomon Islands where use of external inputs is less common. During the ethnic tensions people fled further into the bush and established temporary bush settlements to escape from militant activities in the area. For a number of years they were forced to practice total self reliance as they did not have safe access to Honiara to sell their produce or buy other goods.

Experimenting with Water Cress

Prior to the ethnic tensions, in the early to mid 1990's some men and women farmers in LDA area started to grow water cress in a small river close to the village where they usually made dry season gardens along the river banks. The river is fed by a spring at the base of a hill and flows about 5 km to the sea. Some women farmers planted water cress on a small scale along the edges of the river in the early 1990's and found that it grew very well. They would harvest regularly and sell fresh bundles of watercress in the Honiara market.

But they had a problem with expanding production even though demand was high. They found that when the river flooded after heavy rain the water cress would be washed away. Some farmers noticed that where the water cress was growing between the branches of a stick or log on the banks of the river it would be protected from being washed away. They started to experiment with various types of floating, wooden rafts to hold the water cress in the same way that these branches protected the watercress.

A number of farmers eventually came up with a design of a long rectangular bed with smaller slats nailed across the base of it. The bed is made from a very light weight tree that floats in the water. The tree is readily available, growing in fallow vegetation along the banks of the river. The bed is then anchored in the river with four posts on each corner. But the bed can float up and down along the posts, being hitched on with a sliding bush rope, as the water level rises and falls. This keeps the water cress at the same depth of water all the time and safe from being washed away by flooding.

With this new technology developed by local people, the LDA farmers were able to expand their water cress production and it moved from being a minor crop to an important cash crop for local families.

Commercialisation of Water Cress

Using the floating bed technology many more families started to grow water cress. The river was divided into areas for each family from the nearby villages around LDA area. One family would typically have a 10-20 metre stretch of river where they might have from 2 to 10 floating beds of water cress. Some families farmed these beds intensively all the time while others would increase production at certain times when they had a need to earn more money.

The production of water cress became the main source of income for many families in LDA area. The LDA farmers became the main suppliers in Honiara market. They could grow all the year as the water cress production was not dependant on any seasonal factors unlike many other vegetable crops that are seasonal in this area. Water cress is particularly popular at times when there are not many other greens available in the market. The price ranges from $4to $7 for one bundle. During production they would harvest once a week from each bed. A newly planted bed would take a few weeks before the first harvest and then be harvested every week for a number of months.

Income from selling water cress in the Honiara main market was used mostly to buy store foods. This includes rice, tinned fish, Maggie Noodles, flour, oil and salt. Local farmers commented that when they were forced to go into hiding in the bush during the ethnic tensions and later when they lacked cash income as they were not selling produce in Honiara they were much healthier. They felt that their health improved when they started to eat local food instead of these store foods. Many women commented that their children were healthy and did not get sick very much. Now with a return to regular consumption of store food they find that their children are getting sick all the time. But the store foods are popular and people have returned to buying them whenever they have cash income available. People in this area are very dependant on using processed store foods almost every day.

Pest Problems

Around 1997 a serious pest problem emerged: a small caterpillar that has recently been identified as the diamond back moth. The diamond back moth increased to the stage where it was drastically reducing their production. Farmers tried different kinds of pesticides that were sold by local suppliers in Honiara to try to prevent the insect from destroying their crop. Some of these pesticides worked for a little while but eventually they would stop working. Farmers observed the worm and saw that it went down to the base of the plants when they sprayed pesticides. The pesticide would be washed off by the river and rain.

Eventually they decided to try the spray used on mosquito nets by the malaria control program as they observed that this spray could stick to the mosquito nets for a long time. The chemical is called permethrin. They bought permethrin on the black market from health workers involved in malaria programs as this chemical was not available commercially in Solomon Islands. Initially this worked well and water cress production returned to a high level. But farmers had no advice or information on rates of application or withholding periods prior to sale. Farmers use no protective clothing and often spend hours at a time in the water as they spray.

By the end of 1998 and into 1999 the spray was no longer working. They applied more and more but the insects kept returning within shorter and shorter periods of time. The cost and access to enough spray became a problem and many farmers had become discouraged from continuing to grow water cress.

As mentioned, in 1999 – 2001 people fled the village and abandoned their water cress plots due to a civil war that erupted on the island. Militants from another ethnic group in Honiara were attacking their village so the people ran away into the bush where they built new settlement safe from these threats. But occasionally people would venture down to the river where they had been having so much trouble with the insects on the water cress before leaving the village. To their surprise they found the watercress thriving with no sign of attack by the insects. They would harvest water cress occasionally for their own use and consumption during this period. People were surprised about how the water cress had been able to recover when there was no care or spraying being done.

In 2001-2002, with peace returned and safe access to the Honiara market again, people started to farm the water cress intensively again. But with regular harvesting the pest (diamond back moth) soon came back in force. They used the pesticide again but found that in an even shorter time it was no longer effective. Farmers would have to spray 3-4 times a week to keep the insect under control or lose all of their crop. The spray was becoming difficult and expensive to get. By 2003 only a dozen or so farmers were still continuing with water cress production.

Many farmers again started to abandon the water cress plots. Those that could access the spray continued with production but had reduced yields and increasing costs.

Farmers had developed a new technology for producing water cress and had successfully developed a new product that became their main source of income. No support was received from any agriculture extension officers or NGO's. At the time of writing a local NGO had connected farmers to the PestNet network which had recommended the introduction of a biological control for diamond back moth and a community Itegrated Pest Management (IPM) program to introduce the biological control.

Growing Water Melon for Urban Markets

By
Tony Jansen, Kastom Gaden Association, Solomon Islands

Summary

Laurence and Roko Aldo live in Takwa village on the North East coastal plain of North Eastern Malaita. They have been very successful in cash terms in commercial water melon growing using good management, fertiliser and pesticides. The techniques were learnt from other farmers and a commercial melon seller who wanted to stimulate and increase melon production. However, it is a complex enterprise involving risks relating to expensive inputs, pests and diseases, and health concerns over pesticide issue. Perhaps the biggest problem is the fluctuating market and expense and time involved in accessing it – five hours by rough road to the nearest provincial centre or 10 hours by ship to Honiara. To try and address these different problems they have tried a number of innovative ways of producing melons, including reducing the inputs they use and growing organic melon using local varieties. However, this proved too labour intensive, and now Laurence and Roko have adopted a more diversified farming system and are also growing peanuts on a commercial scale. Although peanuts are less profitable than melons they are less labour intensive, easier to manage, and being a legume, help in regenerating soil fertility. This case study illustrates that farmers can be very entrepreneurial through constantly experimenting and thinking about ways they can improve their farming systems in ways that improve their family welfare and the health of their soil. It also illustrates the thought that Laurence and Roko have put into working out the best way to market their products in order to maximize the returns to their family.

Background

Takwa village is located on a flat coastal plain in North East Malaita. It is five hours by a rough road to the nearest provincial centre or 10 hours by ship directly to Honiara. This area of north Malaita is densely populated. Takwa is a large village centred around a Catholic mission station and secondary school. Land is managed under the customary land tenure system.

Laurence Aldo and Roko Aldo first started growing melon (water melon) for sale in the Honiara market five years ago in 1998. Before that they used to grow a few melons as part of a mixed family garden, producing some melons to eat and a few for sale in the local market. They first became interested in growing melon on a commercial scale after they went to a course about melon farming.

'We were being organised to grow melons for sale to Didao'.

Didao, a Honiara based but locally owned company, wanted to sell melon on a large scale in the capital of Solomon Islands, Honiara. Didao company was offering to buy the melons from farmers in the Takwa area of north east Malaita and then they would transport the melons to Honiara and sell them through their retail outlet. They also arranged training for local farmers in Takwa in commercial scale melon production. The owner of Didao company is a man from Takwa and so he wanted to help farmers in his home village as well as develop a profitable enterprise.

A local man, Opsant Luda, was the instructor for the farmer courses. The farmer's course was run entirely on a private enterprise basis with a fee of $10 charged to farmers who wanted to attend the one week course. Some people were already growing melon commercially and many people grew a few melons mixed in their family food gardens including Roko and Aldo. Dozens of farmers lined up for the courses and started to grow melon as a new cash crop.

'Before we were growing melon in between taro and yam. We never had any pest problems and the melon grew very well but we were only growing very few of them'.

'When we decided to go commercial the problem is with marketing. The problem is that we have too many melons to sell in the local markets. To go commercial we had to start marketing outside the local area.

So Roko and Aldo, and many other farmers in Takwa area, started to grow melon as their main cash crop. In one typical season Roko and Aldo harvest 500-1000 melons from one garden. The melons are sold in the Honiara main produce market or to Didao who comes to buy from the farmers at their farm. They grow melon crops two times in one year.

Sometimes Roko and Aldo sell their melons to Didao but more often they make the journey to Honiara themselves where they believe they make more profit. Didao comes round in a small ship and buys from the area at the farm.

'We sell to Didao if we don't have enough cash to go to Honiara (to cover the expenses). If we go to Honiara we make more profit. '

Didao's price is $1.50 per KG at the 'farm gate' which is much lower than the price in Honiara. A single melon can weigh up to 15 KG (i.e. up to $22.50 per melon if sold to Didao). In Honiara a similar sized large melon will sell for $40-50 (for 15kg) which is double the Didao price. When they go to Honiara they sell 300-600 melons at a time. Usually they would take melons from the lower end of this amount – i.e. about 300-400 would be taken at one time.

But the expenses to market melons in Honiara is quite high: Freight costs $3-$4 on the ship to Honiara for each melon fruit. Two or three people, usually Roko with some of their family members, would go to sell in Honiara. The ship fare is $110 to Honiara for one person and the same on the way back. They find they can usually sell all the melons in about one week. Although this depends on how many other people are selling melon in the market at the same time. Prices for melon are $10,20,25,30,40, and maximum of $50 for one melon fruit. The prices at the market depends on size and quality of the melon and the supply in the market.

Their experience is that from selling 500 melons they earn $8000-$10000 income. Freight: - used to be $1-2 on Walulu, a ship that they can take directly from Takwa to Honiara. The journey takes about 12 hours. But this ship is very unreliable, often breaking down or changing schedules. So sometimes they have to catch a truck to another town, Auki on a bumpy and difficult road (5-6hours) and then catch the ship to Honiara from there (6 hours) or catch a different ship from near Takwa. This costs a lot more. It usually ends up costing $3 - $4 per melon on other ships.

Example: On the last trip by Roko when she travelled on the Walulu the cost was $1500 for freight for 600 melons. She took about $8000 after selling them. They spent $700 on ship fares for herself and the other people who went to Honiara. If you stay for one week in Honiara you would spend $50 per day for everyone. They sleep in the market with the melon. It is too expensive to pay for accommodation and they don't like to stay with 'wantoks'(relatives) because they will ask for too many melons and cut down on their profit.

Box 2.4: Expenses for Selling 500 Melons

Production costs

Seeds: $50

Labour:

- Brushing weeding and clearing: $300
- Planting, weeding, pruning, harvest (family labour) – 4 people, 3 days a week for 10 weeks. = $20 * 4 * 10 * 3= $2400

Fertiliser:

One sack costs $400 which lasts for 3-4 crops = $114 per crop

Pesticide:

- Orthene – used one packet for one spray: small packet – 250g. Cost is $10.00
- So five sprays = $50
- Orthene liquid is $100 – would last for one farm – 5 sprays = $100 for one crop
- Total pesticide = $150

Fungicide: (cost not known)

Bravo for fungus: (cost not known)

Marketing costs

Freight: $1.50 each melon = $900

Transport for sellers: $700

Expenses in Honiara for one week @ $50 a day: $350

Total cash expenses: $2464

Total non cash expenses (family labour): $2400

Gross income: $8000 (average price of: $13.34 per melon)

(note that the price is lower because some melons are usually given away to relatives or are damaged in travel)

Melon Cropping Cycle

Takwa is located on the edge of the Lau Lagoon in North Malaita. It is an area of very high population density for the Solomon Islands. Like most parts of the Solomons, farmers practice shifting cultivation, where bush is cleared and planted to crops for a number of cropping cycles before being abandoned to a bush fallow to restore the soil fertility. Traditionally bush fallows would be from 15-25 years with a large forest regrowing on the site and very fertile and productive soil being regenerated. But as the population grows farmers reduce the fallow period to increase the intensity they use their land. Around Takwa land pressure is very high and so farmers are rarely leaving land to fallow for more than 5 years and more often 1-3 years. As a result there is a lot of land degradation. Soil fertility is going down and bush fallows are getting slower at restoring soil fertility. There are many land disputes as many families simply do not have enough land for all their needs under shifting cultivation. A lot of land in the area was planted out to coconuts in the past. But with the decline in copra prices and the need for more land many people are cutting down coconuts to grow food and other cash crops.

There are two melon seasons during the year in Takwa:

- The first planting is in late February to March – harvest in April/May. (January/February is too wet).
- June-July stop for a rain period in the middle of the year.
- The second planting is in August with harvest in November.

Roko and Aldo usually follow this calendar and have two melon crops in one year.

Because melon farms need a lot of care, and also security from theft, farmers prefer to grow them reasonably close to their homes (say within a 15 minute walk). But this means that they are often growing in very poor, overused soils. Fallow periods tend to be shorter the closer they are to the village where land is used more often.

It is in this type of short fallow environment that Roko and Aldo grow their melons. Generally it is a very short fallow of 1-2 years since the previous crop. Fields are cleared with a bush knife and then burned or left with a layer of organic matter. Roko and Aldo have been experimenting with both methods and find that each one works in different conditions. They usually do not burn but recently have begun experimenting with

burning as they believe it may reduce the incidence of fungal problems on the melon.

They usually use hired labour, $300 for clearing and preparation for planting one melon farm crop. This is for brushing, weeding and clearing. Usually they don't hire labour for planting and on going weeding and pruning but some other farmers do. Sometimes Roko and Aldo are hired to help other farmers grow their melon crops or to carry out the nursery and pruning work which requires specialised knowledge and experience that they now have built up.

After clearing, the new field is marked out with a planting point for each melon indicated by a 1-1.5 m bush stick. The spacing is 1.5m between melons, 4.5 – 5 metres between rows. Once the garden is cleared then they start to make a nursery. The nursery soil mixture is a special mix that is one of the critical components for successful melon growing, It contains: compost soil from mangrove mud; compost soil from the base of the 'abololo' tree [1] and chicken manure. In the training workshop run by Opsant Luda a particular compost mixture was promoted. But since then many farmers, including Roko and Aldo, have been experimenting with different melon compost mixes and adapting and improving on what they learned in the workshop and from other farmers. The mixture is heaped in a compost pile for a number of weeks, ready for use in the melon nursery.

They buy their melon seed from the Republic of China King George VI farm in Honiara. This is a demonstration rice farm run by the Taiwanese government as part of their aid program to Solomon Islands. The seeds cost $50 for one packet. They are all imported hybrid varieties. At different times they have experimented with different brands of seed companies and varieties. Some of the ones that Roko could recall are Empire seeds: Empire 1, Empire 2, Sugar Baby, Flower Mountain. Empire is the best variety from their experience.

The seeds are planted and grown in a nursery. Each melon seed is planted into a small home made nursery bag made from a carefully folded *heliconia sp.* leaf filled with the compost soil mixture mentioned above. After germination it is grown for two weeks and then transplanted to the garden. Often the nursery is made close to the house to allow for daily care and watering. Any insects such as caterpillars are hand

[1] Abololo is a very large rainforest ficus species. Interestingly these trees are often left standing where other trees have been cleared. They are often traditional burial sites or shrines from pre Christian times. These 'tabu' sites are still very important and respected.

removed in the nursery. Roko and Aldo make their nursery on a raised bed about 1 metre off the ground. It is made from bamboo with flattened bamboo panels for the base. The nursery is placed in the sun.

Before planting the young seedlings one handful of the compost mentioned above is mixed in with the soil at each planting site. The compost and seedlings are taken in a wheelbarrow to the garden or carried in bags on their back. The melons are then carefully planted and watered. After transplanting the melons have to be carefully looked after. The family usually carry water to their garden in containers for hand watering - especially during the first few weeks.

Once the melons are growing they apply synthetic fertiliser three times before harvest. The fertiliser they use is a compound containing a different mix for each application. The first application is potash and phosphate ammonia. For the second application they use potash, phosphate and ammonia. The third application is potash and phosphate. One sack of fertiliser will last for about 3-4 melon crops. One bag or sack is 20 – 50 kg. They estimate they spend over $400 to buy the different compounds for the fertiliser. This will last for three to four crops.

Coconut leaves are usually laid out in the gardens for the melon vines to grow on top. This is to allow the vine tendrils to hold onto the coconut leaf to prevent it from being blown in the wind and to stop fungus on the melon fruits by keeping the fruits from having direct contact with the soil. Pruning of the side shoots on the vines follows a careful system and is done from a few weeks after planting. Pruning is considered very important to get good size fruits.

Once the farm is established the family would usually visit it 3 times a week, and spend a full day working in the field. It takes two and a half months to harvest the melons from planting. This means three months from the time the nursery is established.

Pest and Fungus Problems

The main pest problems are different types of insects. There is the orange melon fly, known locally as *wawa* –a caterpillar, and a small black fly can effect melon. When they first started growing melons they did not use any pesticides. Roko reports that they did not use spray because:

'we didn't know how and we did not need to. No problem with insects. When people started to make big farms the insect problem has increased'.

They started to use spray after the melon farmers course in 1997 where they were taught how to use the pesticides and fertiliser 'spray'.

'*When insects started to spoil the crop we started to spray. This time the insects are much worse. If you don't spray they will sweep everything.'*

It appears that the insect problem has gradually worsened as more and more farmers grow large monocultures of melon.

'In our food gardens the insects are worse than they were a few years ago.'

Many local people believe that the increased use of pesticide on melon farms has led to a general increase in pest problems on all their crops. It is difficult to verify this as there are other factors at work such as the declining fallow periods, gardens being established ever closer together and poor crop rotation possibly leading to a continual build up of pests and disease.

Chemicals being used by Roko and Aldo are:

- Orthene for insects
- Bravo for fungus
- Target for insects

'*Orthene makes the melon fly run away but it does not die.'*

The melon fly is considered the biggest pest problem for melon and farmers report that it is getting worse since so many people started to grow melons.

Aldo, Roko and their family mix the chemicals with water, following the instructions. They use a stick to mix the spray and are careful not to put their hands inside. They spray with a sprayer purchased in Honiara. When they spray they try and spray following the wind so the spray does not blow back onto them. Like all the other farmers in the Takwa area they don't have any protective clothing or masks to cover with. After they spray the people who do the work often feel sick.

'*After spray we run to the water to wash it off. We use two spray tanks on one crop at a time. '*

They usually spray every two weeks from planting to harvest.

- Orthene – used one packet of powder for one spray: small packet – 250g. Cost is $10.00. So five sprays = $50

- Orthene liquid is $100 – would last for one farm – 5 sprays = $100 for one crop

Fungus can spoil the base of the melon vines when the melon is already big. Some times it grows in places where the melon has been pruned. If this happens the whole vine will die.

Lately they have been having more problems with fungus than in the past. They have been experimenting with other practices to reduce fungus apart from the use of fungicides.

'*Before we used to leave mulch on the ground when clearing the new farm area but now we are cleaning the whole area of organic matter. Now we are starting to burn because fungus is spoiling it too much. The fungus spoils the leaf, the fruit and rope. '*

They use a chemical called Thriff to make the melons flower and fruit.

'Without this it wont have a lot of fruit. Sometime we don't use it but it still has fruit.'

Roko and Aldo report that the price for fertiliser and spray is going up.

Some farmers in Takwa area have been poisoned when using spray. One woman had the spray pour down out of her bag onto her body and ended up in Malu'u hospital, the nearest rural hospital. Most people who use the spray report feeling unwell in the period following the spray. There was one incident where a spray container was cleaned in the same river that supplies drinking water to the village. A number of people were poisoned in the village.

What They Do with the Money They Earn

According to Roko their main aim in farming melon commercially is to earn money for school fees for their children. Two of their children, Cyrol and Tommy are in secondary school at a national high school in Honiara – King George and Bishop Epali schools. It costs $1200 for one year at King George and at Epali $1100 for one year. Plus they have to pay for all the other living expenses for their two children studying in Honiara.

If they need to they will buy new tools like a wheel barrow while they are still in Honiara after selling the melons. They also buy the seeds, fertiliser and other spray needed for the next crop. After marketing in Honiara they usually bring back food such as bags of rice, boxes of Maggie noodles, tinned fish, biscuits, tea, and sugar. All of this is purchased in

Honiara where it is cheaper than in the village. They share some money with the family members who helped with the crop and to help family members with other needs. They leave money for the students in town for their expenses there.

'We come back with some things we need in the house and some cash. The profit we make from a melon crop will last until next crop. '

Roko and Aldo do not have a bank account. They have no easy access to banking services, The nearest bank is 6-7 hours away by truck in Auki and they rarely go to Auki because of the poor condition of the road.

Roko still makes gardens for the families food. At the time of this interview she had three different gardens where she was growing sweet potato, edu (*alocasia sp.*), a little bit of taro, eggplant and sliperi kabis (island kabis). Their gardens are in areas where they practice a short fallow of 2 to 4 years before replanting. There is a lot of pressure to continuously crop land around Takwa. Some people from bush communities who are related to them have settled on the coast and also use some of their land. This is becoming a problem. In the future many people will not have enough land for all their needs. Some melon farmers are clearing coconut plantations to plant melon.

Other Cash Crops - Peanuts

In order to maintain the soil fertility Roko and Aldo decided to plant peanut as a rotation crop with melons. Roko and Aldo wanted to use their land more intensively for growing melons so they decided to try a peanut crop rotation on one of their gardens close to their house. Since then they have developed peanut as a cash crop. They find peanut is an easier crop than melons. The family does the planting themselves. Their daughters help with weeding. Mostly they have very few pest or disease problems with peanuts which again is very different from the melon. They have had some small problems with a caterpillar and fungus but it has not lead to much loss of production.

When they harvest the peanuts they pull up the whole plant and carry it to a covered work area under their house. There they dry the peanuts and then remove the peanuts and put them in bags to take to the market.

They have found that after growing peanut the soil has improved and melon can be cropped again later on.

The peanuts are sold in Honiara and in local market. More recently they have been concentrating on selling in local market. At Takwa they sell a small heap of 6 or 7 peanuts for 20 cents. They usually sell the peanuts harvested from one crop over a period of about one month.

One bag of peanuts can be sold for $130 - $150 in Honiara. They prefer to sell bags in Honiara so they can return quickly to the village rather than spend one month selling small heaps like they do in the village. They usually produce 9-10 bags of peanuts from one garden. If they did sell one 50kg bag in small heaps of 6-7 peanuts that can earn $1300 in Honiara but this would take one month to sell them and they would spend a lot of money staying in Honiara. So they prefer to sell the bags at one time. They can earn up to $1500 from selling 10 bags of peanuts in Honiara.

They found that the peanut was also a very good commercial crop when grown on a large scale that did not need nearly as much labour inputs as the melon did.

'I am thinking of just growing peanut. It is easy to grow, and we don't need any spray or hired labour.'

Experimentation with Melon Farming

Roko has tried a number of experiments to see if she can reduce the amount of chemicals needed to produce melons. In one experiment she used compost instead of fertiliser and used local varieties of melon that grow better without all these inputs. There are three local varieties that Roko and Aldo knew of: red seed, black seed, and reef melon. They put leaves for mulch around the melons. With the hybrid seeds and inputs they usually get about 9 melons per vine (with hybrid seeds, compost and fertiliser). With the local variety it usually has 3-4 melons per vine with compost fertiliser.

The local melons were big like the hybrid ones if she used a lot of compost. They sold them locally. Many local people will not buy the commercially farmed melons as they are aware and concerned about all the chemical sprays used to grow them.

In the experiment she planted 100 melon plants. The melons were sold in the local market from $2-$20 depending on size and demand.

A total of about 350 melons were harvested. With an estimated average price of $6 = $2100

In another experiment Roko tried one farm of local varieties of melon with a home made fertiliser. She used sea weed as a fertiliser and it grew well. She got the same result as using fertiliser with hybrid varieties with nine melons per vine. But some melons were smaller in size – i.e. there was not consistency. She made the local spray herself and applied it on the melons three times. But she found it was very hard work to collect the sea weed and make the local spray. In the end she decided it was easier to buy the chemical fertiliser spray in Honiara.

'If someone made the local spray it would be good to buy it from them and use it.'

They can see that there is a market for melons produced without fertiliser and spray.

'Some people come and ask in the market if we use fertiliser. Then they don't buy it if they know we use fertiliser. Some people lie.'

On the other hand there is still strong demand from many people for the large and consistent melons produced by commercial farmers like Roko and Aldo.

'Lots of people in Honiara like big melons. They want big melon, quality melon. The local varieties of melon are variable and often smaller. They taste good but most people want the big melons.'

Orthene is a systemic pesticide. It could be in the melon and so there is some basis for consumer concern.

Conclusion

Aldo and Roko have very successful taking on a larger scale of commercial melon farming. They have earned a lot of money by village standards and have been able to manage inputs such as labour, fertiliser and pesticides. They learned from other farmers and the efforts of a commercial melon seller who wanted to increase production of melons. They have also innovated in their melon production and experimented with ways of reducing the amount of inputs they need. Organic melon production using local varieties was possible but required too much labour compared to the use of inputs. Commercial melon farming is a complex enterprise with certain risks including pests and disease, variable markets and concerns over the health effects of pesticide use. They have diversified and now grow peanuts on a similar commercial scale. While less profitable they have found it also to be less work and easier to manage.

3. Samoa

Fine Mat Weaving – An Income Generating Opportunity for Rural Women

By
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Summary

This is a case study of an outside agency (i.e., an NGO called Women in Business Development Inc. (WIBDI)) providing a critically important role in revitalizing a traditional craft (i.e., fine woven mat called *ie sae*) which was in real danger of dying out, and transforming a normally unpaid activity exclusively performed by Samoan women into an income earning opportunity. Traditionally the *je sae* was an intrinsic part of Samoan culture and helped provide an indicator of a family's wealth and social standing. This traditional skill had been replaced by much cruder mats, *lalaga,* which are produced in large quantities and are sold in the market. Through the enthusiasm of a woman Samoan high chief, Pula Faraimo, the WIBDI started a Fine Mat Project. They sponsored a young girl, Vaipoli, of exceptional weaving skills, by making weekly payments into the family bank account. They also succeeded in attracting the skills of a 72 year old woman, Vilealava Vaepae, to help start the intricate mat. Others were also sponsored to make mats. After six years the *je sae* has become an income earner for some of the poorest women in 102 villages in four of the major islands in Samoa. Those women wish other disadvantaged women to benefit from a similar income opportunity. In addition it has enabled some women to gain respect and support from their husbands and their success has been applauded and supported by senior government politicians. This case study provides a good example of how outside support and encouragement can be so important in learning, identifying and nurturing skills and income opportunities, and in empowering some of the most disadvantaged people. In this case it involved women helping women, strong leadership, appreciating that stimulating changes take time and perseverance, and appreciating the need for adding a new dimension to helping preserve traditional skills – so important in maintaining the Pacific Way of Life. It also helps illustrate the idea that traditional skills can be harnessed in a way that helps people accommodate to, and benefit from, applying them to a modern market situation.

Background

The Women In Business Development Inc. (WIBDI) Fine Mat Project is unique in that it takes a normally unpaid activity exclusively performed by a Samoan woman and turns it into a job opportunity. More noteworthy is the product of the activity, the *ie sae,* an intrinsic part of Samoan culture by which every family's wealth and social standing is measured. The feat of weaving an *ie sae* or traditional fine mat was a long-term vocation for all women. To complete one was a milestone in one's life and an achievement that carried social status. With the passage of time however, the art of making this integral part of Samoan culture has declined to the extent that many Samoans have forgotten or have never known what a real *ie sae* should look and feel like.

Samoans have a saying in regard to the fine mat, where one mat of exceptional quality would be considered to be worth a thousand mats, *tasi ae afe,* the name of one of the first fine mats historically recorded[1]. The fine mat has since deteriorated to such an extent mats are instead churned out to meet the demands of a culture that has been commercialised into valuing quantity rather than quality. Large numbers of fine mats are given in presentations in place of the single or few high quality *ie sae* of past times. The weave of these mats resembles the weave of a sleeping mat, the stripping of which is quite wide. In the past, traditional fine mats were beautiful works of art and old mats looked like they were made "with strips that were about one millimetre wide "[2]

Fine mats would usually be kept under the mattress or mats where they would lie flat and as they aged become soft like the quality of silk. The present fine mats are now made too large to be stored in this manner. Smaller mats of an inferior quality wrapped in bundles of ten, are also being used for presentations. In the absence of job opportunities in the village environment, women had resorted to producing quantities of *lalaga* or small mats which can be completed in one day, earning from ST$5.00 to ST$10.00. The *lalaga* are rarely opened for display and when taken overseas in quantities for cultural events, they can be the cause of families paying large sums for excess baggage. Once overseas there is also the problem of where to store the larger mats in houses that are smaller and not open-plan like Samoan *fale*. By contrast, one true fine mat of exceptional quality can be carried in hand luggage, stored and displayed easily.

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1 Krämer A, 1902. The Samoan Islands. Stuttgart: E. Schwiezerbart. vol. 1, p. 31

2 Krämer A, 1903. The Samoan Islands. Stuttgart: E. Schwiezerbart. vol. 2, p. 345

The Elements of the *Ie Sae*

The original fine mats were considerably softer and finer because of the special species of pandanus used (p*andanus tectorius-laevis)* and the more detailed process of preparation and weaving of the leaves. Fine mats were made with pandanus leaves that had been dipped in boiling water or steamed in an earth oven. The leaves were peeled so only the shiny side of the leaf was used and soaked in salt water for two to five days. After the soaking period, the pandanus leaves would then be thoroughly washed in fresh water and hung in the sun to dry. The leaves were then rolled into bundles in preparation of the stripping and weaving. Only the shiny side of the pandanus leaf was used for the fine mat, the other side was processed differently and used for a *fala lau ie* or *fala vali,* a mat normally used as a bed covering. The fine mat weavers would use from 10 to 16 strips to the inch as a measure of the fineness of the weave. This lengthy and labour intensive process of preparation taking up to ten days to complete.

As well as changing the type of pandanus used for weaving, other processes have been lost so knowledge of the traditional ways is in danger of being lost forever. Historically a weavers family and village supported the weaver of a fine mat, her husband would be extremely proud, and when the fine mat was completed, a huge feast would accompany a process called *ta'elega*, where the fine mat was bathed. After the bathing process, the fine mat would be shown to the whole village in another ceremony known as *fa'alelegapepe.*[3] It was only after the *fa'alelegapepe*, that the fine mat was decorated with feathers.[4] Small parrot feathers were used for decoration, and these were attached in one line on the bottom and top ends of the fine mat. The feathers added to the beauty of the very fine weave, in contrast to the large mats produced today that can have upwards of three rows of large dyed feathers, that shift attention from the large weave.

Ministry of Women's Affairs

In 1993, the Ministry of Women's Affairs published a report titled *'The Women of Samoa'*, which addressed the Policy and Programme Development undertaken by the Ministry. One of the fourteen policy priorities was Culture and Tradition and Arts and Craft Production. The concerns of the loss of the fine mat tradition were addressed in a three-year project headed by Pula Vaifou Faraimo, a woman and Samoan

[3] Literally translated as showing off the baby.

[4] Krämer A, 1903. The Samoan Islands. Stuttgart: E. Schwiezerbart. vol. 2, p. 345

high chief of Saleimoa village. The project focused on improving the quality of the fine mat, by encouraging weavers to strip the pandanus finely before weaving and to use the right species of pandanus. In an effort to ensure the fine mat was soft, or as near as possible to the quality of the traditional *ie sae,* the weavers were taught to use the very young leaves of the pandanus tree.

Upon completion of funding the Ministry's Fine Mat Project ended in 1997 where Pula Vaifou Faraimo with her love of Samoan culture and heritage, was determined that this Samoan treasure would not be lost. In an effort to keep in touch with the women she had worked with, she asked to be part of the WIBDI team that visited the villages. Pula wanted to ensure the women continued to strip the pandanus thinly and the quality of weaving maintained. Her participation was so successful WIBDI applied for and was granted donor funds to pay for her services, which included the Fine Mat Project and as a cultural advisor for WIBDI.

The Beginning of the WIBF Fine Mat Project

Tufutafoe-tai a coastal village on Savaii is one of the most inaccessible villages in Samoa. The cyclones of 1990 and 1991 completely destroyed all the original village homes, the school and churches, causing families to move inland. Crops were also devastated halting the village production of cocoa, coffee and copra. In 1993 the villagers started returning to the seaside and rebuilding their houses. A fresh water pool by the sea had been completely covered by sand and coral and was no longer a consideration as a source of water. There was much exposed lava rock which made it difficult to grow crops. Added to this was a local businessman who had secured permission to cut trees in the rain forest inland for a logging operation. When fresh water is scarce or not available, residents have to resort to bathing in a swampy area near the sea.

In 1998 the WIBDI Fine Mat Project began in Tufutafoe. WIBDI staff had been impressed with the weaving skills of a young 16-year-old girl named Vaipolii. Vaipolii was deaf and mute and when her family needed cash her father and brothers would look for work on nearby plantations, where work was often hard to find. Vaipolii's weaving ability combined with her family's need for cash, inspired WIBDI to approach her parents for their daughter to weave a fine mat for the Director. Arrangements were made for the family to open a bank account for Vaipolii so weekly payments for the fine mat could be deposited. After a month into the programme another two weavers, Ala and Mele, saw the benefits of the weekly

wage to Vaipolii's family and asked if they too could be part of the project. Sponsors for their two fine mats were found and the WIBDI Fine Mat Project was born.

The WIBDI Fine Mat Project provides women weavers with the opportunity to earn an income through sponsorship. A weaver of exceptional skill can earn up to ST$100 a week where one such example is Paua Saumalu also of Tufutufoe. Through the WIBDI programme Paua first earned ST$40.00 per week and as she perfected her craft her weekly earnings increased from ST$80.00 to ST$100.00. Paua has been weaving since the project began, completing her first ie sae in 2001 and now possessing such skill, that she can weave a very fine *ie sae* in four months. The WIBF field staff provide support to Paua and other weavers through weekly follow-up visits, to check on the quality of weaving and to make payments. On these visits the staff cover topics ranging from cultural change and conservation, to cash and time management. The Fine Mat Project is only possible because of the many people who continue to sponsor the fine mat weavers and who value quality and preserving a beautiful part of Samoan culture, rather than the current practice of quantity for show.

TheJourney of Weaving an *Ie Sae*

The challenge for WIBDI was to encourage women to return to the fine weaving process needed for making the traditional *ie sae* and for pride to be restored in the revival of an essential part of Samoan culture. Every weaver WIBDI worked with would not try the fine weave, as it was both difficult, long and arduous. To challenge the women to weave finely, WIBDI decided to have all staff members weave a fine mat using the very young leaves of the pandanus. Staff weaved in their spare time, at home and in the villages on visits. The women were so taken by what WIBDI had begun they attempted the fine weave. WIBDI called the fine weaving they were attempting *iniini,* which translates as 'very fine' or 'thin'. This was the term given to the process used by Pula Vaifou Faraimo to encourage the weavers to weave finely

Research from early writings suggest the size of the *ie sae* never went beyond 10 or 12 *aga*, with one *aga* being the hand or foot span of the weaver. The modern mats made for presentation can be up to 30 *aga* but the weave is as wide as that of a sleeping mat. Fine mats were to be folded like cloth when used in presentations and be so soft that folding was a natural process, in contrast to the very large weave and

size of the present fine mats that do not allow this. When WIBDI tried the very fine weave, the weaving tension used for large mats was out of proportion, and the sides could not be kept even. WIBDI then decided to make the *iniini* up to 13 feet long by 11 feet wide only. The pandanus leaves were not separated as in the traditional process, instead Pula encouraged the use of the very young soft leaves to ensure the fine mats were soft.

With the problems of trying to convince the women to weave finely, WIBDI staff realised making a true *ie sae* would be more difficult. WIBDI first concentrated on assisting the weavers to adapt to the fine weave, before moving on to attempt the true *ie sae.* Genuine fine mats woven with the special *lau ie sae* are very difficult to work with and only a few villages were still preparing the pandanus in this way. WIBDI began preparing for weaving of the *ie sae* by finding villages that still processed the pandanus in this special way. In 2000 WIBDI staff travelled to the island of Manono where the women of Lepuiai village produced weaving with the *ie sae* pandanus. Although the pandanus was prepared in the traditional manner the problem of the large weave remained and the fine mats the women produced resembled the *fala lau ie*. The first meeting with the Manono weavers did not go well, for although they prepared the pandanus in the right way and the women wanted to join the WIBDI project to earn money, they refused to weave with the fine stripping.

One weaver of Lepuiai, Vilealava Vaepae agreed to work with WIBDI, as she needed to earn cash for her family and had already begun a fine mat that was taking a long time to complete. Her fine mat was for a relative who had organised the WIBDI visit to Lepuiai. The staff then persuaded Vilealava's relative to pay for her weaving through the WIBDI programme giving Vilealava her first paying job at the age of 72 years. On completing this fine mat however, she was still reluctant to use strips that were made even finer.

WIBDI realised the only way they could convince Vilealava and others was for their staff to each weave a genuine *ie sae*. WIBDI staff had never attempted an *ie sae*, the first fine mats woven used 10 strips to the inch; and the second fine mat, used 23 strips to the inch. WIBDI presumed if a staff member with very little weaving experience could weave a fine mat with 23 strips to the inch, then weaving an *ie sae* would be simple. This proved very wrong, and WIBDI staff found the specially prepared *lau ie sae* very difficult to work with, especially the stripping and the beginning weave of the mat. Vilealava was later asked

to help where reluctantly she stripped the *lau ie sae* very finely. Vilealava also began WIBDI's first *ie sae*, with the process known as *fatuaiga*, which is different from the beginning of the usual fine mats made today. The *fatuaiga* process was so difficult that the *ie sae* had to be returned to Vilealava to complete.

Although disappointing for WIBDI staff, Vilealava found that despite her age and failing sight, she was still able to do an expert job of beginning this fine mat. The *ie sae* was then brought back to Apia and the weaving process continued. It would have taken years to complete at the rate staff were able to weave, so the fine mat was taken to Tufutafoe to be completed by Paua Saumalu. This was Paua's first attempt at the genuine *ie sae,* and the fine weave was difficult for her to work with but through her dedication and diligence she completed the *ie sae*. This first genuine *ie sae* of the WIBDI project, together with the fine mat done with 23 strips to the inch, were taken to the villages for display by WIBDI field staff. This proved invaluable in motivating women to appreciate the beauty of the work that could be produced if they focused their efforts on quality rather than quantity.

From the shared creation in 2000 of the first genuine *ie sae* in the villages of Lepuiai on Manono Island and of Tufutafoe on Savaii, the WIBDI traditional fine mat project has gone from strength to strength. The weaving group in Lepuiai that began with Vilealava Vaepae, now has all the women of the village involved. From this start in one village, WIBDI now have women weaving the *ie sae* in 102 villages on the islands of Savaii, Upolu, Manono and Apolima.

The Fine Mat Project – Empowering Women and Families

The first WIBF training programme at Tufutafoe gave birth to the Fine Mat Project as an income generating opportunity. The women who started on the programme, and who continue to weave, now earn a weekly wage and are able to pay for school fees and school uniforms. The women now participate in village and church functions because they have the cash to make their donations. They all have savings accounts with the micro-finance programme, and are able to take out loans for emergencies. Stories in their own words from two of the older women in the Tufutafoe group can serve to illustrate the Fine Mat Project as empowering the women weavers and their families.

Sosefina Mino's Story

'My family used to be very poor. The only light we knew as children was kerosene in an empty tin. All we had to eat was boiled breadfruit with coconut cream. We had no money so we couldn't buy sugar. There was nothing to make tea. We drank Samoan cocoa, but we used coconut cream in the cocoa because there was no sugar. I can only remember having one *lavalava* to wear all week. On Sunday, I would wear my only good dress to church. When I grew up and had children, I looked for pieces of old clothes or material to wrap my babies in. We had no mosquito nets and used *siapo* (*tapa* – bark cloth) to cover ourselves at night. Because water was scarce, we drank coconuts. Our children took papaya and coconut to eat at school, or they just didn't eat until they came home.

Our relatives who lived on Upolu helped us a lot, by coming to visit with things, or they would buy things from us that we grew. My husband died in 1962, and since that time, I worked in nearby plantations, weeding. I would earn around ST$ 5 a day, working from 7:00 am to 5:00pm. Because I started work at 7:00am, I would have to leave my house and children before 5:00am in the morning, to walk to the plantation. This is how I put my children through their schooling. There was no other way to earn money in my village, because we are so isolated. I have children who live overseas now, and they have helped me over the years. My other children live in the village with me.

The Women in Business programmes have made things so much better for the women in my village who take part. We have a group of 16 women who take part in the Fine Mat Weaving project and the women earn money every week for their families. Other people in the village have made fun of us for being involved in the programmes, but we were so poor, we kept working because we were able to earn money in our own village and we were able to afford things. Now we don't have to leave the village and we get enough food for our children. We can also pay for the children's school fees and school uniforms ourselves and we don't have to ask our relatives in Apia, or my children who live overseas. We can also get a loan when we need money. Some families in the village are poorer than others. Now that the women in my group are doing so well, we want to share our good fortune with them.'

Salafai Tauiliili Salue Esau's Story

'Just after the hurricane in 1991, I got sick, so my sisters took me to New Zealand to live with them until I got better. I returned before Christmas in1999. Before I left, we were so poor, that all we ate was breadfruit and coconut cream. I got so sick that my sisters took me away. They helped me with money; otherwise, I would not have been able to educate my children. My family is so poor. We didn't earn any money. My son had a labourer's job for a while, and he earned ST$30 for two weeks. We couldn't even afford to buy soap for bathing. We would use a piece of cloth to rub ourselves clean in the water. Our village is probably the poorest village in Samoa. There is no regular transport and if someone is sick we have to ask for the use of a pick-up truck, but that costs money. Usually we have to walk for miles and miles, and we can't afford an umbrella for the sun or rain.

When I got back from New Zealand, I was so happy to see the development in my village through Women in Business. This development has helped my family so much. Now we can afford to buy the little things that we need like soap, sugar, and kerosene. We can always pay our electricity bill. I have two daughters who are involved in the programmes and their families are so happy because they can afford to buy things and to pay for the children's school fees and school uniforms. There are no jobs for the men in our village.

I would like the other women in our village to benefit like we have. We don't have many opportunities to earn money, because we are so isolated. I would like to be able to earn more money myself, but we don't get many opportunities in the village. I think that it would be good for us to share the good fortune that has come to us.'

Changes in the Family

All the husbands of the Tufutafoe weavers are now supportive of their wives and the weaving project. In the early days of the project, there were many arguments between the weavers and their husbands often because of the time spent weaving. The women were not accustomed to allowing time for a cash generating activity and the husbands expected their wives to do all the usual household chores as well as their weaving. A number of weavers left the project because of pressure from their husbands and those that stayed were offered assistance by WIBDI through counselling both the husband and the wife. Field staff allowed time and provided opportunities for the husbands to participate in the WIBDI meetings.

When problems became too difficult to handle on the spot, WIBDI field staff would spend a night with the families, offering advice and support in a caring atmosphere. The weekly nurturing visits proved invaluable in establishing a relationship with the families enabling WIBDI to slowly gain their trust and respect. There is now one weaver whose husband helps her with the weaving, and other men who also help with the 'women's work' as they appreciate the status their family now enjoys in the village, and the sense of family well being they have gained from their wives' earnings.

Recognition of the *Ie Sae*

In April 2002, WIBDI held a meeting on the island of Savaii to assess the fine mat project and its impact on the weavers and their families. All the women present completed questionnaires, and underlined how useful the Fine Mat Project had been for them. Every weaver had documented an improvement in her family's livelihood and sense of personal and communal well being. Having a regular source of income, as well as the opportunity to access and manage a loan through the micro-finance programme had contributed to empowerment, not only of herself, but also of her family. The delegates insisted on writing a letter to Government asking them to address the socio-economic issues that had been raised, not only during the conference, but also as part of the training by WIBDI staff members. A letter was then written to the Secretary of the Ministry for Internal Affairs and copied to the Prime Minister and his Cabinet, as well as to the Leader of the Opposition. The letter also called for a change to the name of the Samoan fine mat – from *ie toga*, to *ie Samoa* or *Ie o Ie Malo*.

Samoans refer to any gifts being presented as *toga* and the *ie toga* the fine mat presented as a gift or with the gifts. There is an old story of a Samoan woman accused of a crime in Tonga who presented a fine mat to the King of Tonga in return for the lives of herself and her child. The King was so impressed with the beauty of this fine mat that he released her and she returned to Samoa and began weaving in the district of Amoa on Savaii. In a recent documentary on the artefacts in the Royal Tongan Palace, the Princess Royal referred to their greatest wealth as being the possession of the 'kie Samoa'. The letter written to the Government stated that: '…while Tongans are placing much importance on our fine mat, we in Samoa continue to degrade its value, by producing the ugly fine mats being used in cultural presentations today.' The

Samoan weavers were worried that sometime in the future the Samoan fine mat would indeed become the *ie toga* (fine mat of Tonga) with Samoa losing yet another beautiful part of its culture.

This point and others raised by the weaver's conference comprised the topic of an address delivered by the Prime Minister to the women of Samoa on Mother's Day 2002. The Prime Minister issued a challenge to the women of Samoa, " *e au le inailau a tamaitai* ", asking the women of Samoa to return the fine mat to its status of the past, where it was made of exceptional quality and used with reverence and respect.[5] In another address on February 28th 2003, the Prime Minister further reiterated this challenge and for the people of Samoa to take pride in their culture and return to using the traditional *ie sae*. In a speech on the same day, the Member of Parliament for Apolima and Manono, announced that in his constituency, they had banned the use of the *lalaga* and were returning to the use of only the traditional *ie sae*.

The WIBDI could not have asked for better outcomes of the Fine Mat Project as they had known and nurtured the weavers for six years. The women WIBDI had worked with proved the opportunity to earn a regular income and the will to be able to care for their families, was the motivation that had turned their lives around for the better. They were conducting themselves as a group of women who were comfortable in their surroundings and who now take the initiative to contribute positively to their society without fear of ridicule. Such perceived levels of empowerment were all WIBDI needed for confirmation that even though the journey had been frustrating, the Fine Mat Project had delivered.

[5] Meaning in effect; women always get the work done.

Honey Production by Women Groups

By
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Summary

This case study is an example of how an external organisation, in this case an NGO, Women in Development Business, Inc. (WIBDI), can identify and exploit an opportunity for helping rural women. A 1996 study done by WIBDI for FAO identified bee keeping as a potentially viable project for such people, since it is not labour intensive, can be done near the home, and provides an opportunity for them to implement a small business enterprise. The formation in 1997 of the Beekeepers Association of Samoa Inc (BASI) resulted in them cooperating with WIBDI to attract donor funding for training and purchasing hives which were given to rural women and youth groups to set up small businesses. Initial training has been followed by regular calls, by a bee-keeping adviser, to the hive operators to check on what they are doing and the state of the hives. Seven families have lost their hives since they had not worked according to the terms of their contract. A total of 38 families and one youth group in a number of different villages have been given hives. Also WIBDI have successfully maintained their own honey bee production and replacement programme which is necessary for the long term sustainability of beekeeping as an income generating activity. The honey is sold locally and in New Zealand with the help of WIBDI. The case study illustrates the catalytic role an outside agency – in this case an NGO – can play in partnering with another agency. In doing so they provided an opportunity for new skills to be transferred to farmers, who with appropriate mentoring, benefited from a new income earning opportunity of a marketing channel basically set up with outside help.

Background

The Women in Business Development Inc (WIBDI) have used small scale technologies to provide rural women with the opportunity to participate in cash generating activities while at the same time learning the different aspects of managing a small business. In 1996 WIBDI conducted a study for FAO on the Role of Women in Apiculture Development and identified beekeeping as a viable agricultural project well suited for rural women in Samoa.[1] Beekeeping is not labour intensive,

can be done at or near the home and provides rural communities the opportunity to engage in a small business activity. While the idea of beekeeping is not a new concept for Samoa, past attempts have not involved women or rural populations. Beekeeping or apiculture is the practice of keeping bees to produce products ranging from honey to propolis and pollen.[2] In the context of WIBDI beekeeping has predominantly been for the production of honey as a source of income for rural women. Honey which is made up of simple sugars is produced by bees from the sucrose sugar found in the nectar of flowering plants.[3]

"*The aim of beekeeping for honey production is to manage colonies in such a way that the maximum worker bee population coincides with the start of the main honey flows of the area."*[4] Understanding the complexity of the bee life cycle is a core part of beekeeping, as it is to maximise the potential of the colony through manipulating and or enhancing the situation as may be required for productivity. In the hive there are three main types of bee; the first is the "queen bee" which is the mother of the hive, where she lays the eggs and maintains leadership of the hive through chemicals called "pheromones"; second is the "drone bee" which is the male bee and can provide genetic variation in the hive; and last is the "worker bee" which is the female bee, and does all the work in the hive such as cleaning, feeding and grooming the queen bee, to gathering nectar and pollen. The "worker bee" is also the protector of the hive where it has the ability to sting or bite when threatened. All three types of bee are essential to the productivity of the colony, for instance a queen bee has a life span of five years and if she is lost and not replaced the colony will perish, just as if there are not enough "worker bees" which have a life span of 45 to 120 days, the productivity of the hive will be limited; and the importance of the "drone bee" is for reproduction through the marrying of the young "queen bees".

In 1987 the now defunct Samoan Bee and Honey Company (SABHO) operated 1600 hives producing honey for export to Europe. Since then honey production had been minimal with only one experienced beekeeper able to rear queen bees.[5] In 1997 the Beekeepers Association of Samoa

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1 Green S. Green M. and Eleitino M. of the Women in Business Foundation, October 1996. Role of Women in Apiculture Development - input to FAO Project TCP/SAM/4551: Apiculture Development Strategy for Western Samoa.

2 http://www.spc.int/rahs/Projects/Apiculture4E.htm

3 http://www.spc.int/rahs/Projects/Apiculture4E.htm

4 NZAC Advisory Mission, 1999. Report on Queen Bee Production Workshops for Village Women and Small Business Trainers and the Beekeepers Association of Samoa, training leaflet.

Incorporated (BASI) was formed with the aim to maintain and improve the beekeeping industry in Samoa. In developing a close relationship with BASI the WIBDI used the idea of beekeeping as a small business initiative, and accessed donor funding for the training and purchasing of hives which were given to rural women and youth groups to set up small businesses. An advisory mission to Samoa in 1997 and 1998 contributed greatly towards strengthening the beekeeping industry and identified the potential for 3000 to 5000 colonies of bees for a possible market of bee products for export.[6]

The Beginning of the WIBDI Bee-Keeping Project

Women are the main beneficiaries of all WIBDI programmes, however for the beekeeping project focus was on the whole family and in a few cases young people. Each family group selected for participation was approached through the women of the family, and in all cases the women attended training sessions, usually with a son or daughter. Through a donor grant in 1997 WIBDI organised training for 20 people in beekeeping, where two women were provided with five hives each to establish a small business. This was followed up with funding in 1998 to set up 160 hives and further expert training was provided to enable the WIBDI to train a further 60 rural women and young people in the art of bee-keeping.

While the initial training in 1997 was to provide women with the basic skills needed for beekeeping, the 1998 training was to enhance participants awareness of beekeeping and to help increase the productivity of the hives through a series of Queen Bee Production Workshops. "The queen is the mother of the workers and drones in the colony, and is also the producer of the "queen substance", a mixture of chemical compounds called phermones that bind the colony together as a cohesive unit." [7] One of the most important tasks of a beekeeper is to ensure that a colony has a young laying queen, as failure to do so may reduce productivity or destroy a year's worth of honey crop. The successful rearing of queen bees can itself be another product and

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5 NZAC Advisory Mission, 1999. Report on Queen Bee Production Workshops for Village Women and Small Business Trainers and the Beekeepers Association of Samoa, p. 6

6 NZAC Advisory Mission, 1999. Report on Queen Bee Production Workshops for Village Women and Small Business Trainers and the Beekeepers Association of Samoa, p. 12

7 Matheson A., 1999. Practical Beekeeping in New Zealand, GP Publications, NZAC Advisory Mission: Report on Queen Bee Production Workshops for Village Women and Small Business Trainers and the Beekeepers Association of Samoa. p. 78

source of income. As a result of the queen bee rearing workshop, six of the participants are now proficient at rearing queen bees, and now work with the WIBDI beekeeping advisor on requeening hives.

Nurturing WIBDI Project Families

As with other WIBDI projects the importance of a training and follow-up programme is essential to ensure the success of a project. Through donor assistance a vehicle was made available for follow-up visits enabling project participants the expert services of a bee keeping advisor, who worked with WIBDI for three days a week, to monitor the families and the hives. His assistance in the follow up of this project has been invaluable, because problems are taken care of immediately. The provision of a vehicle made it possible to increase the yield or productivity as it was found that the best time to check the hives was the early morning, where transport for the bee keeping advisor proved crucial.

The nurturing philosophy of WIBDI had made learning the theoretical aspects of beekeeping easier for participants to comprehend as the follow-up done on a weekly basis by the WIBDI field staff and the bee keeping advisor ensured participants understood the terminology and the techniques necessary for bee keeping productivity. The reports from the advisor's visits would play a large part in the decision making process regarding the removal of hives and purchases of honey for shipment to New Zealand and for sale in the shops of Apia.

WIBDI have also successfully managed to maintain their own queen bee production and replacement programme, which is necessary for the long term sustainability of beekeeping as an income generating activity for rural women and their families. There are currently 14 Villages with beekeeping projects on the island of Savaii which include Iva, Fagamalo, Faletagaloa, Fatuvalu, Lano, Puapua, Salelologa, Saipipi, Sasina, Taga, Tafuatai, Tufutafoe, Vaisala and Vaipua.

Honey Production

During October to December in 1998 honey was sold in bulk at ST$5.00 per litre through WIBDI. The islands of Savaii produced 120 litres and Upolu 180 litres. A further estimated 250 litres had been sold or consumed by the participants with Savaii producing 150 litres and Upolu producing 100 litres. Since 1st March 1999, 148 litres had been extracted collectively from both islands. In 2001 WIBDI shipped honey to New Zealand receiving NZ$3.00 per kilo and in 2003 honey is sold locally at

ST$7.00 per kg. All honey from WIBDI hives are now marketed through a local beekeeper who sells all the honey locally.

In total 26 bee keepers have been established on Upolu and 12 on Savaii. Families were initially supplied with two hives each. After regular monitoring, specific areas and keen beekeepers were identified, with those not conforming to the WIBDI contract having their hives removed and given to families who did. Due to weather conditions, honey production has been extremely good and bee keepers have managed to sell honey locally in their villages. They have supplied retail shops in the Apia area with honey and two bee keepers have collected and sold quantities of propolis in New Zealand through consultants involved with the advisory mission.

Problems

A few families enthusiastic from the outset did not follow through after the hives were delivered. WIBDI ensures that participants sign a contract with WIBDI on delivery of the bee equipment. This enables the removal when the conditions are not met. Valuable lessons were learnt with setting up a bee keeping project of this magnitude as WIBDI had a very large inventory of equipment which needed to be stored, monitored and distributed. A total of seven families lost their hives as they had not worked according to the terms of the contract. The hives have been removed from these families and given to other families or groups. Thirty eight families and one youth group have been recipients of hives. Twelve families including the youth group are on Savaii and 26 families live on Upolu. By giving many families a few hives each, WIBDI are able to maintain a training system where they learn to work their hives while the hives are developing.

WIBDI anticipated setting up ten families but after the training process, it was found that the participants needed further on the job training. The hives were then given in smaller lots to more people. This process enabled WIBDI to filter out those who were not genuinely interested, and the hives were given to people who showed more interest and potential. WIBDI have also managed to identify areas of both Upolu and Savaii where the bees thrive and concentrate on families in these areas.

Conclusion

The Beekeeping project receives regular maintenance through the organic farming project that WIBDI is currently involved with, where bee keeping is one of the activities listed for organic farming. WIBDI projects such as bee-keeping in the rural villages, and the introduction of a system of organic certification have paved the way for niche marketing for a section of Samoan society which was previously dependent on outside intervention for their cash needs. WIBDI has given people an understanding of bees and their uses in the environment, as well as the uses of the products of bee keeping. The ongoing follow up and maintenance programme conducted by WIBDI field staff ensures that benefits of the project continues with ongoing training in small business as well as bee keeping. These activities have kept people in their villages and curbed the social problems created by people moving to urban areas in search of paid work, only to find none and become a burden on their urban families.

Organic Farming

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Summary

Because of the smallness of their PIC economies in relation to their potential competitors a potentially very important ingredient for them making their export products competitive is to make them unique in some way so they fit into a niche market. This case study describes how a local NGO, Women in Business Development Inc. (WIBDI) took the initiative in helping establish the Samoa Organic Farmers Association (SOFA) after asking for help in 1999 from the National Association for Sustainable Agriculture, Australia (NASAA). The object of this request was to ask help in setting up and monitoring an organic certification system in Samoa that would be recognised globally. This has required a training programme of potential farmer participants and a painstaking application and certification process. Because of the accreditation NAASA has with external agencies including the International Federation of Organic Agricultural Movement (IFOAM), WIBDI can now export a fully organic certified extra virgin coconut oil at a premium price to Australia, Germany, New Zealand and the United States. A number of organically certified farms now exist in Samoa and WIBDI hopes that eventually SOFA can take over the responsibilities for organic certification and training. In the meantime there are recommendations for establishing a closer working relationship between the government (i.e., the Ministry of Agriculture, Forestry, Fisheries, and Meteorology (MFAMM)) and WIBDI and SOFA. Agricultural extension officers are, as a result, being trained in the process of organic farming and certification. This case study illustrates how a locally committed NGO can play a catalytic role in fostering a commitment from an external agency that is critically important in legitimising the quality of a product from a small country – thereby helping it establish a niche market. It also illustrates the potential benefits of establishing beneficial working linkages between farmers, and the private and public sectors, potentially so important in sustaining such initiatives.

Background

To compete in a global market the Women In Business Development Inc. (WIBDI) recognised the need to find niche markets they were capable of servicing to enable their small producers the opportunity to sell their village based products. With the growth of health and environmental conscious consumers, WIBDI was inspired to explore organic farming using the Coconut Oil Project. Organic farming supports and strengthens the biological process of farming without the assistance of chemicals such as synthetic fertilisers or pesticides. It is also a means for growers to return to productive farming practises of the past, that are environmentally sustainable. WIBDI believed as the coconut trees grew organically in the first instance, obtaining the official organic training and certification from a reputable organisation would only improve the branding and marketability of the virgin coconut oil, as an organically certified product ready for export.

The virgin coconut oil produced by rural villagers was of such a high quality the chemist who conducted the tests advised WIBDI to keep the price at a premium as the market would initially confuse the unfamiliar virgin coconut oil with the cheaper copra oil. The problem for WIBDI however was despite the quality of the product, the unfamiliarity of the virgin coconut oil to the market proved a hindrance in negotiating a premium price. For example when WIBDI initiated exports to Australia buyers were unwilling to pay the premium price as there was confusion with copra oil. After examining the potential markets, WIBDI identified organic farming as a way to add value to the coconut oil that would be internationally recognised and attractive to consumers.

Preparation for Organic Certification

The organic training process began in 1998 in partnership with Bioglobal Consultancy, Samoa. The consultants identified two main parts of assessment required for organic status of a production site: the examination of the physical site and the surrounding boundaries; and interviews with the people who farm and manage the site being assessed. Given the intensity and expense of the project, these two main aspects had to be examined, as organic certification is an international guarantee to consumers of quality, where specific protocols are to be adhered to by farmers so they may acquire and maintain the certified organic status.

The preparation process included the interview of prospective farmers to gauge whether chemicals were used on the area to be certified and if

they were or had been used, it was necessary for a written action plan to stop the use of chemicals. If however chemicals had not been used, the farmer had to provide a written promise to state such and that it be verified by the village leaders. The physical assessment of sites looked at a number of factors such as whether chemicals had been used, to the types of crops grown. Of the six sites assessed all were family owned plantations, where all but two applied for organic certification in 1999.

Over the ten months period, the WIBDI staff and a number of farmers were trained in all aspects of organic farming culminating in preparation for submission to a certifying agency, that included the physical process of mapping the farms. Mapping is a time consuming process that involves drawing a map of the farm, by walking its length and breadth, and noting the locations of vegetation and farmed crops. The preparation process also required specific information be documented which included:

- A clearly defined map of the area to be organically certified.
- Lists of all persons :
  - farming in the coconut collection zone and
  - who deliver coconuts to the Direct Micro Expelling
- Records of deliveries/sales and purchases
- A production record of amounts and dates of oil produced and sold
- A flow diagram of the DME plant
- A description of how the plant is cleaned
- Protocols for :
  - transport systems and cleaning
  - storage
  - plant hygiene and cleaning
- Packaging used
- Quality assurance and controls for the production of the product
- Export certificates, bills of lading
- WIBF management structure

- Farm Plans which include:
  - boundaries, crop patterns, key features of farm
  - farm location map
  - record keeping system
  - quality assurance protocols for DME
  - evidence of past history of land uses
  - farm management plan - new plantings, fertility management, weed management, other crops, animal health, biodiversity, buffer zones.

National Association for Sustainable Agriculture, Australia (NASAA)

In 1999, WIBF applied for organic certification through the National Association for Sustainable Agriculture, Australia (NASAA). Formed in 1986 NASAA is a non-profit company that currently certifies 900 producers, processors and retailers, and over 7 million hectares in Australia; and 700 operators and co-operative based farmers in the Australasia-Pacific region. NASAA has accreditation with the Australian Quarantine and Inspection Service (AQIS) and the International Federation of Organic Agricultural Movement (IFOAM). The latter audits certification organisations such as NASAA to guarantee the service provided meets the IFOAM minimum standard. Organic certification gives quality assurance to consumers and provides producers the opportunity to access lucrative markets such as the USA, Australia and Germany, where an organic product must be certified by an organisation accredited to IFOAM.

The NASAA Certification process typically includes three stages. The first stage is “Pre-certification” which can be for a duration of 12 months and includes initial and subsequent inspection of soil samples for residue testing. The second stage is the “Conversion to Organic” which can be for a duration of 1-2 years and includes developing an organic management plan, farm map and flow diagram. When a production area has used chemicals, there is a 3 year period before the production area can be certified. The final stage of “Organic Certification” is only granted upon proving the organic farming standards can be adhered to and the appropriate documentation maintained, such as records for inspection which must be retained and updated annually.

Upon the completion of the NASAA Primary Producer Comprehensive Inspection Report conducted in December 1999, WIBDI had their first four farms certified in conversion status which included Mano Togamau in the village of Siumu, Popo Malaulau in the village of Saoluafata, Ulu Tuifa'asisina in the village of Tafua Tai and Liko Tino in the village of Lano. The Report further noted *"Given the invaluable organic and environment input available…….the first years conversion can be said to have been completed providing scope for full certification status in Dec(ember) 2000".* In 2000 three farms received full organic certification and in 2001 five farms, with conversion status given to an additional five farms. Conversion status is the term given to a farm that has committed to organic farming and has never used chemicals or is in the process of not using chemicals in its farming practices. The conversion status in most instances, requires a minimum period of three years before full organic status can be achieved.

Organic Exports

Malaefono Plantation at Saleimoa was the first organically certified farm in the country and its owners Richard and Suela Cook can be credited with the birth and growth of organic farming in Samoa. They have been part of the WIBDI training process and continue to market their products, where they now export certified organic bananas and ginger to New Zealand. WIBDI hope other organic products will be developed from the organic farms, and Malaefono Plantation will then serve as the nucleus services centre for organic products.

Since receiving full organic certification of five farms involved with the WIBDI programme, oil sales overseas have increased considerably and new markets have opened in Germany and New Zealand. WIBDI can now export a fully organic certified extra virgin coconut oil to Australia, Germany, New Zealand and the United States. A total of 14 tons was exported in 2001 earning ST$98,000. In 2001 exports to Australia rose from one ton per month to two, with three tons exported in October.

In 2001 WIBDI helped establish the Samoa Organic Farmers Association (SOFA) with Richard Cook of Malaefono Plantation as its first President. It is the hope of WIBDI that SOFA can be strengthened to take over the responsibilities for organic certification and training. WIBDI will continue to assist all organically certified farms until SOFA has been strengthened to manage this support. Until such time, all new farmers are encouraged to begin training in organic farming with the WIBDI field staff, and to

prepare their farms for mapping and submission to the NASAA for registration. Inspection of all organic sites is undertaken annually by NASAA at the expense of the producer. This process involves a visit and inspection of audit trails from a NASAA certifying officer. In 2002 the certification process by NASAA saw a total of 13 farms receiving full organic certification, and four farms in conversion status.

Problems

In the first preparation process for organic certification WIBDI experienced difficulty with prospective farmers giving contradicting information as to whether chemicals had been used on their farms and plantations. To resolve this issue if it was identified through the physical assessment that chemicals had been used, other land for potential organic farming would be clearly separated, enabling a staged conversion. For example one farm that may have used chemicals in the past may have a total land area of 100 acres where 40 acres could be clearly separated as the prospective organic site.

Another problem was the lack of commitment of some project participants. For example WIBDI secured donor funding of ST$70,000 for the organic farm training and certification project, only to have some farms receive full organic certification then stop producing coconut oil. In the Coconut Oil Project equipment was removed from seven sites, because the families did not abide by the terms of their contract with WIBDI, primarily because of their failure to consistently produce coconut oil. Of the seven sites, two farms have since had their equipment returned because of their organic status.

Nurturing WIBF Project Families

There are currently eight sites involved in the DME Organic Virgin Coconut Oil Project in the villages of Siumu, Saoluafata, Saleimoa, Vavau and Malua on Upolu, and Patamea, Taga and Foailalo on Savaii. As with other WIBF projects the philosophy of nurturing participants through on site visits to provide essential support to the project families remains crucial to ensuring project success. As required by NASAA thorough records are to be maintained and updated where the quality of the oil is to be monitored and training in organic farming continued. The weekly visits also provide the WIBDI micro-finance programme which assists with family savings and meeting the costs of project maintenance. The benefits of the DME Organic Virgin Coconut Oil Project can be seen through the families that participate, such as the Mano Family of Siumu.

The Mano Family

When Mano Lami was made Mayor of Siumu village, the family took out a loan of ST$2,000 to pay for the presentations of fine mats and food to the village. Such presentations are accepted practice and without the coconut oil project, the Mano family would have needed to ask their children living in Australia to provide this sum. For the Mano family it was a source of great pride the village knew they could afford the loan and they were able to repay the total amount two weeks later, when oil was sold. Mano Lami knows the income from the project has enabled him to care for his family financially and to make regular contributions to the village and the church. The Mano family has remained faithful to the project and was one of the first five farms to receive full organic certification.

A Strategic Alliance Between NGOs and Government

In February 2003, the WIBDI Executive Director accompanied the Minister of the Ministry of Agriculture, Forestry, Fisheries and Meteorology (MFAMM) and his team on a tour of organic farms and research organizations in New Zealand, in a search for markets and research possibilities. A list of recommendations from the tour is now the subject of a paper to cabinet for approval. The recommendations suggest a closer working relationship of the MAFFM with WIBDI and the SOFA. WIBDI field staff, together with the President of the SOFA are currently involved in training Agricultural Extension Officers in the process of organic certification and organic farming.

In 2002, the Nonu Samoa company won the Samoa Exporter of the Year Award as well as the Environmental prize, and in 2003 went on to win an International award for their organically certified Nonu. Nonu Samoa is part of the WIBDI grower group of organic farms, where their success and that of others in identifying niche export markets has contributed to the growth of organic farming in Samoa. The latest certification inspection by a NASAA certifying officer, has approved the full organic status of thirteen farms. Additional assistance, especially from Government to sustain the organic certification process, would also benefit the industry, an initiative that now seems tangible given the organic training by the SOFA President and WIBDI field staff of MAFMM officers. These success stories of organic certification for Samoan farms and products give WIBDI much satisfaction as WIBDI has worked hard to help producers achieve this status, so essential to the success of niche marketing efforts.

The Coconut Oil Project

By
Adimaimalaga Tafuna'I, Women in Business Development Inc., Samoa

Summary

The Women in Business Development Incorporated (WIBDI) learnt about the potential and operation of the Direct Micro Expelling (DME) technology which can be used at the village level and produces virgin cold-pressed coconut oil within an hour of cracking open the coconut. Women traditionally have been responsible for producing coconut oil and so it was natural to introduce this technology to women. WIBDI introduced this equipment to a number of extended family groups with a strong leader in locations where there are a large number of coconuts and the areas are geographically representative of the country. The Pure Coconut Oil Company was set up in 1997 to act as a nucleus services centre, offering market producers a market for their coconut oil. A number of value added products have also been produced for sale both locally and for export. The coconut oil producers are contracted to sell 70% of the oil to the company but the majority are selling 100%. Through their earnings the families are required to maintain a savings account and some women also have an account in their individual names. Those savings can make them eventually eligible for loans, for example to pay school fees and electricity bills, and for purchasing materials for cottage industries (e.g., mats). Although husbands have been part of the training programme from the beginning, the project is still largely in the hands of women, and has had a positive impact in reducing their somewhat traditional subservient relationship with men. WIBDI continues to provide follow-up nurturing functions to the oil producers through a small amount of money taken from the revenue received from the Pure Coconut Oil Company. Finally to improve the export marketability of the coconut oil, WIBDI has expanded the project to include organic training and full organic certification – which is the subject of another case study.

Background

The Coconut Oil Project combines the three concepts at the centre of all Women In Business Development Inc (WIBDI) endeavours: Technology, Trade and Tradition. The Direct Micro Expelling (DME)

technology is a simple technology which is well suited to the rural environments. Trade occurs when the virgin coconut oil and other by-products of the technology are sold and tradition is protected as family groups remain in the village earning from the work where they live. Copra production had always been viewed as the domain of men and now the DME technology could provide WIBF with the opportunity to involve women and youth in the production of coconut oil.

In Samoa coconut oil production for export had traditionally been the economic activity of village women. Dr. Penelope Schoeffel states: 'Until Theodore Weber introduced the innovation of exporting dried copra in the 1870s, a prime source of income for the Samoans was the manufacture of coconut oil for export. This was traditionally a woman's economic activity, though men took part in it when it became a major commercial product.' [1]

In searching for viable rural projects, including the revival of coconut oil production by village women and youth, WIBDI learnt by chance about the Direct Micro Expelling (DME) technology, the subject of a monthly satellite meeting for ECOWOMAN. [2] The DME technology is simple and easy to use, and bypasses the arduous process of making copra. The technology enables village families to enhance traditional Pacific oil-making practice without having to take coconuts to a mill for pressing. The DME process is an appropriately small-scale technology that allows rural families on tropical coasts a chance to use existing village coconut resources to produce pure virgin coconut oil, at the same time recycling materials in a sustainable process.

Direct Micro Expelling Technology

Direct Micro Expelling technology is a new all-weather, small-scale technology which enables the production of virgin cold-pressed coconut oil within an hour of cracking open a coconut. It is a version of moisture-assisted oil expelling developed by Dr Dan Etherington at the Australian National University in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Dr Etherington took his inspiration from a traditional practice in the atoll country of Tuvalu, where oil is extracted from dried grated coconut in an unusual process. After sun drying the flesh of a dozen grated coconuts, the flesh from a freshly

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1 Schoeffel, 1977. The Origin and Development of Women's Associations in Western Samoa 1830 – 1977, Journal of Pacific Studies 111. P. 11.

2 ECOWOMAN is an NGO network of Pacific women promoting women's involvement in science and technology.

grated coconut is mixed in, immediately before pressing. This Tuvaluan 'moisture assisted' expelling principle has been adapted and developed in the DME technology, which can process 300 to 500 coconuts per day producing 25 to 45 litres of oil. The oil extraction efficiency (OEE) rate of the DME system is 85 per cent of the available oil.

The DME system involves four basic steps:

- Collecting and husking the coconuts.
- Finely grating the fresh mature coconut kernel with small motorised (usually electric) graters. It is important to note that diesel powered generators to run these graters can be fuelled by the virgin oil produced by the DME process.
- Drying the grated coconut to a specific moisture content in about one hour on an innovative, all-weather, solar-thermal drier fuelled by the discarded coconut husks and shells.
- Pressing out the oil with a specially designed robust press, known as a SAM press, that uses interchangeable cylinders.

The beginning of the Coconut Oil Project

In July 1995 WIBDI wrote to Dr Dan Etherington and asked his permission to use the technology for a rural village project. At the suggestion of Dr Etherington WIBDI was invited to Fiji by the United Nations Industrial Development Organisation (UNIDO) to attend a training programme on the DME technology to be conducted by Dr Etherington. The technology had already been introduced in several villages in Fiji, where the projects were being managed by village communities. The projects however experienced difficulties, for example in the village of Waivunia in Savusavu production stopped as there was no money to purchase a part needed for the generator, which cost FJD$40.00. At Dromoninuku another village close to Savusavu, the young people were skilled at oil production, but were not included in the decisions made. Two groups within the village took turns to produce oil, but there was no follow-up on their activities, which stopped when people lost interest or when equipment broke down. At the time of the UNIDO training at Dromoninuku, production was regular and the group had trouble coping with local sales, which were brisk.

On return from Fiji, WIBDI conducted a sub sector analysis of the coconut industry in Samoa, to assess the viability of producing virgin coconut

oil. The sub sector analysis indicated that a ton of copra from approximately 5000 nuts, could earn ST$1135.00 compared with 5000 nuts being processed with the DME technology into coconut oil, with earnings in the vicinity of ST$4400.00.[3] The project locations were also identified where the key criteria included; families have access to substantial supplies of coconuts; families have the numbers of people needed to work on the project; and the villages were to be geographically representative.

The combination of the Fiji experience and earlier WIBDI projects identified important lessons in targeting prospective participants. When working in a village or community setting, people were always willing to take part, but were reluctant to take responsibility for things such as paying for maintenance bills. By contrast, when a family was earning cash from a project, participation tended to last longer, and payment for necessary things to maintain the project were made, as the family could see the direct benefits. WIBDI would offer the coconut oil project to village extended families where an average extended family living in one village could have up to 40 people. This would also enable one strong leader to take responsibility, rather than WIBDI having to contend with many village elders as leaders in a communally based project.

Villages involved with the Coconut Oil Project

In March 1996 WIBDI placed the DME equipment in the villages of Siumu, Fasito'otai and Fagaloa on Uplou and Foailalo and Pu'apu'a on Savaii. Of the five villages, only Siumu and Foailalo still produce. The Foailalo producer has been successful in supplying the local market and regularly sells oil for cosmetic purposes to the village and the neighbouring Salelologa. In 1998 the next four sets of equipment were placed in the villages of Lano, Tafua-tai and Patamea on Savaii and Saoluafata on Upolu and in 2001 four sets of the new model of DME equipment were placed in Saleimoa, Siumu and Saoluafata on Upolu and Patamea on Savaii. The last four sites developing into the most productive farms.

Contracts and Market Development

The donor requirement for the coconut oil project was for the initial funding to be used specifically for equipment and training. WIBDI recognised that to ensure the long term sustainability of the project the

[3] This figure was based on local oil sales using the price of the locally produced coconut oil as the price base.

marketing of products was essential. The Pure Coconut Oil Company was set up in 1997 to operate as a nucleus services centre, offering village producers a market for their coconut oil, while at the same time ensuring that any profits made are shared equally, by producers and the marketing arm. The nucleus services centre purchases the oil from the village producers and exports most of it to markets overseas. It has also developed a number of value added products, which it offers for sale both locally and for export.

The oil producers are contracted by WIBDI to sell 70 per cent of their oil to the Pure Coconut Oil Company. The producers are encouraged to use the remaining 30 per cent of the coconut oil for their own needs, including sales locally and for production of value added products. The majority of the producers, however, prefer to sell 100 per cent of their oil to the nucleus services centre. In the contract there is also a provision for the oil producers to pay WIBDI the equivalent of five litres of oil each production week, to help with expenses incurred in the WIBDI follow-up nurturing process. This payment is deducted by the Pure Coconut Oil Company from all sales and given to WIBDI.

Contracts are also signed with farmers committing them to the organic process. WIBDI monitors the records for production and sales and conducts ongoing training in the organic farming processes. Once overseas markets were secured it was necessary for WIBDI to negotiate contracts with the producers, as WIBDI had learned from previous experience the inability of producers to ensure a consistent supply for local markets . In 1998, the Pure Coconut Oil Company had secured a small market to supply Polynesian Airlines with gift packs for their business class passengers. At least four women were involved in the production, which consisted of a small cloth bag containing a bottle of moisturising oil and a small bar of coconut oil soap. After supplying two orders, WIBDI found that the supplier of the soap did not produce enough for WIBDI needs. The supplier would only make soap when a client was waiting to buy the product which was a problem as the soap needed four weeks to mature. WIBDI eventually solved this break in supply by having the Pure Coconut Oil Company produce soap as a back up.

Value Added Products

The WIBDI has conducted workshops in making and packaging coconut oil soap to encourage oil producers and other women to make coconut oil soap. The women are also encouraged to use local leaves and

flowers to produce scented oil. Virgin coconut oil is produced mainly for export where the oil is used for cosmetics and edible oil. Locally it is used as a skin and hair product where some edible oils are sold to local cottage industries for the production of biscuits and doughnuts.

The Pure Coconut Oil Company, markets bulk oil and produces moisturising oil, insect repellent and soap for the local market. A sun tan lotion and skin balm has also been developed, but requires further financing for packaging and marketing. The coconut meal residue from the production of the coconut oil can be used in baking and for stock feed. A dairy farmer on Savaii purchases all of the meal residue that is produced on the island, where current supplies are insufficient in meeting his needs. The dairy farmer observed within four days of feeding the coconut meal there was a 10 per cent increase in milk production.

To enhance the export marketability of the coconut oil WIBDI expanded the project to include organic training and full organic certification through the National Association for Sustainable Agriculture, Australia (NASAA). NASAA is an internationally recognised certifying body, affiliated to the International Federation for Organic Agriculture Movements (IFOAM). The organic certification process has resulted in the export of a very high grade extra virgin coconut oil worth ST$98,000 in export earnings in 2001. Currently there are eight sites involved in the DME Organic Virgin Coconut Oil Project in the villages of Siumu, Saoluafata, Saleimoa, Vavau and Malua on Upolu, and Patamea, Taga and Foailalo on Savaii.

Nurturing WIBDI Project Families

As part of the WIBDI philosophy to nurture projects, field workers provide essential on-going support to the project families in the form of weekly visits to the sites. Records and quality of the oil are monitored and training is continued in small business management, production, packaging of value added products and marketing. Further training needs are identified during these weekly visits as is the need for equipment maintenance. Maintenance is carried out by the WIBDI technical person who also conducts training on simple machine maintenance for family members. The weekly visits also provide ongoing training in organic farming practices and delivery of the WIBDI micro-finance programme which assists with savings.

The Coconut Oil Project – Empowering Women and Families

Since the woman has been the person responsible for bringing income-earning opportunity to her family, she has attained some changes in status in the family which she would not have experienced so actively in the past. Her husband, for example, would now seek her advice and discuss more decisions with her, while other members of the extended family would also seek her advice on issues they would normally have discussed only with her husband. Women manage all but three of the coconut oil production sites, and through these women the whole family has been empowered.

While women in the rural areas are increasingly acknowledged as sole income generators within the family unit, this has not automatically meant a change or improvement in social status. Although women usually manage the finances and their advice on some issues may now be sought, the male head of the family still has primary control on where money is spent. It also appears that most women remain comfortable with their traditional status and their access to the decision-making processes in the village. Within the existing traditional system; as daughters and sisters they can have access to the village council; as wives access through their husbands; and as mothers they have access to their sons and daughters who make up the *nuu o alii* and *nuu o tamaitai*.

Micro-Finance Programme

Women on the project are also empowered individually through their new ability, to save money and to take out a loan, either collectively or individually. WIBDI requires all project participants to commit to a micro-finance scheme by saving at least ST$5.00 each time they are paid. The families have a savings account which is given in the name of their project operations: for example, *Malaulau Farm* for the Malaulau family of Saoluafata. The family has access to this account for their family needs and for the maintenance of the DME equipment and drier. Some women prefer to have a second savings account in their individual names, for cash they earn themselves. This gives them a source of cash which they can spend without discussion with their husbands.

The micro-finance scheme enables women and their families to make savings and eventually to become eligible for a loan of up to 60 per cent of their savings. Analysis of loan applications shows the three most

common reasons to apply for a small loan are to pay for school fees, electricity bills and materials for cottage industries, such as pandanus leaves for weaving. Women take it upon themselves to ensure that children are educated, clothed and stay healthy. The self-esteem of the project women, and indeed of whole families, has improved greatly with the opportunity to earn cash in the villages.

In all of the projects WIBDI is involved with emphasis is placed on benefiting the whole family rather than the women alone. Village men involved in the coconut oil project are happy with the improved situation in their families and although they are still 'in charge', they appreciate what the women have brought into the families through the WIBDI programmes. The husbands on the projects have been part of the training programme from the beginning. They have gone through the processes of planning and budgeting and know how important it is that their wives are part of the decision-making process. The husbands are also mindful the projects were begun because of their wives and give them credit for this by always conferring with them about spending the money.

The Malaulau Family

The Malaulau family at Saoluafata is another example of the DME technology benefiting a whole extended family. Forty-seven people depend on the project for their livelihoods. This number includes two nuclear families living near the plantation who receive payment for nuts gathered; family members who help with production; and school children whose school fees are covered by money generated through the project. Furthermore, their church donations are made with proceeds from the project. Aiga Malaulau sums it up thus: 'The project has enabled members of our family who didn't have jobs to make meaningful contributions to the family, and not just sit back waiting for those working overseas to send money. Also, we save money, by using the oil for cooking our food, and the coconut meal is used for feeding our pigs.' Aiga feels her self esteem has greatly improved, where the negative effects have been people believing her family are so wealthy, they ask for oil without offering to pay. Nevertheless, her husband and head of their extended family, Malaulau Popo Aiulu, is more than happy about being able to provide for his family financially.

The Coconut Oil Project processed with the DME technology has provided rural families the opportunity to earn an income through remaining in

the village using the resources of their environment. The Project has combined the three concepts at the centre of all Women In Business Development Inc) endeavours: Technology, Trade and Tradition. The Project has enabled rural families to earn cash on a regular basis, thus enhancing their livelihoods and offering the women, their husbands, children and members of their extended families the opportunity to contribute to the village and church through their own means. The women on the coconut oil project, and other WIBDI programmes, have been empowered by the opportunity to be involved in an income generating activity where they do not have to leave their villages.

Women in Business Development Incorporated

By
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Summary

The Women in Business Development Incorporated (WIBDI) was formed in 1991 and was the first NGO of its kind in Samoa. Three concepts underlay most of its endeavours: weaving together technology, trade and tradition. This is done through helping the more disadvantaged (i.e., women, youth and people with disabilities) use their talents and locally available resources to overcome poverty and stimulate sustainable development in their own rural villages. By helping such people generate cash incomes, they become empowered, more self-reliant, and potentially become less dependent on remittances. At the same time, with an emphasis on respecting and making use of tradition in a positive manner, they are contributing to the good aspects implicit in the Pacific Way of Life. A number of case studies already presented illustrate the critical catalytic role the WIBDI has played in combining the concepts mentioned above. Further examples are presented in this case study. Particularly important in these endeavours have been: seeking relevant information about possible income earning opportunities; learning from the experiences of people in other countries who have already responded to analogous opportunities; obtaining funding (i.e., from government and donors) to provide training and follow-up activities to those it offers such opportunities; developing support systems and partnerships – both domestically and abroad – so that those responding to such opportunities benefit financially; and trying to ensuring that the families and not just the individuals who respond to such opportunities, benefit. The WIBDI recognizes that in such a process, adjustments will be required in the light of experience and there will always be individuals who will drop out for one reason or another. Success comes slowly and requires perseverance and a long term commitment. Two areas not stressed in the other case studies but that are mentioned in this one as being important foci for WIBDI are both associated with the modern cash oriented economy. These are challenges in helping beneficiaries use micro-finance wisely, and helping them develop good book keeping and planning skills.

Background

The Women in Business Development Inc.(WIBDI) was established in 1991 as the Women in Business Foundation (WIBF), the first non-government organisation of its kind in Samoa. The name was changed recently to incorporate it's actual activities. A group of seven women comprised its founding members and of shared concern were the difficulties women experienced establishing a small business and the lack of opportunities available to women in this field. As the scope of WIBFI has widened it has also come to recognise the growing numbers of families unable to generate income where they live and the dependency on remittances for cash needs. The WIBDI is thus committed to poverty alleviation and the sustainable development of rural villages; utilising the products of the rural environment to generate income; and establishing and sustaining a Samoan rural village economy that is no longer dependent on remittances.

The WIBDI manages rural development programmes through small business training where participants learn by doing, a firm philosophy of the organisation's beliefs. The WIBDI works in over 102 villages on the islands of Upolu, Savaii, Manono and Apolima, where programmes include the Fine Mat Project, the Rural Bee-keeping Project, the Direct Micro Expelling (DME) Organic Virgin Coconut Oil Project, and the Micro-Finance Network. The WIBF has over 200 subscribed members with an elected Executive Board of five that includes both a President and Deputy President. The daily operations of the WIBDI is managed by an Executive Director and a staff of nine employees, where all but one employee are based in the office premises of the National Council of Women in Apia.

The WIBF vision is: That women, youth and people with disabilities in Samoa are able to contribute fully to the development of themselves, their families and their country through income generation, job creation and participation in the village economy.

The WIBF Mission is: To help women, youth and people with disabilities to achieve this vision by providing them with skills, opportunities, access to finance, and access to markets.

The objectives are:

- To provide long-term training, access to finance and counselling support to women, youth and people with disabilities who wish to generate income through business or employment;

- To identify and gain access to markets for products made by women, youth and people with disabilities;
- To establish the Women in Business Foundation as a financially secure organisation with the resources to carry out its mission.

The overriding values and beliefs are:

- That a Samoan model of development must take into account Samoan values, tradition and culture;
- That sustainable change occurs slowly and requires a long term commitment;
- That women and youth need to develop sources of income that benefit Samoa, by reducing reliance on remittances and foreign exchange.

The Early Days of WIBDI

While the WIBDI have programmes in many villages around Samoa the early beginnings of the Organisation were relatively small and assistance motivated out of necessity. In December 1990 Cyclone Ofa destroyed plantations and farms where families were left to find alternative ways to generate an income. The situation worsened after Cyclone Val in February 1991, and the taro leaf blight in 1994. The crops that families relied on for food as well as income were devastated and the need to supplement the weekly income became critical. The WIBDI encouraged urban women to use their talents to earn an income that would supplement what their men were earning. Women were encouraged to create handicrafts, weave mats, cook food, pot plants, sew clothes, and plant vegetables and other food crops. The problem however was that the activities were unsustainable given the limited markets available for the women to generate cash.

To help women sell their products and to meet and talk with other women facing the same problems, the WIBDI organised monthly markets held on Saturday mornings. Stall holders registered earnings of up to ST$1000 and smaller stalls earned anything from ST$200 to ST$600. The success of the market days generated subsequent requests from Government to organise markets for national events which included the Teuila Festival. To maximise on the potential of these events WIBDI conducted workshops in packaging and quality control, as well as co-ordinated the designing and printing of business cards, ensuring products could be sold with contact details for future sales.

Handicrafts – WIBDI in the Village

As people became aware of the work of WIBDI, more requests came from rural women for assistance in generating an income for their families. The WIBDI's focus was originally on handicraft production, an activity that many rural women were already skilled at, and for some, the only activity associated with generating cash. The problems however were twofold; the poor quality of craft production and the unwillingness of more skilled craftspeople to share their expertise outside of their own families.

To expose women to the high quality and range of craft available in other parts of the Pacific, the WIBDIF through donor assistance brought women from Fiji, Tonga and Niue to facilitate workshops. The workshops taught a range of valuable skills from the art of shell jewellery, to the preparation and weaving of swamp reed, pandanus and tapa making. Participants gained an insight into the making of handicraft from women experts of other cultures, and at the same time a challenge to foster community spirit by sharing their skills with others in their own and in other villages. The success of the workshops served as the foundation for the WIBDI database of skilled craftspeople in handicraft production who would later become local consultants leading monthly workshops in the villages.

The first villages assisted by WIBDI were Satitoa, Matatufu and Lotofaga. The WIBDI first introduced the making of shell jewellery in the village of Satitoa, located in the district of Aleipata, on the eastern coast of Upolu. Funding was accessed for the Satitoa group of women to open a coffee shop and handicraft centre where they sold coconut and shell jewellery, handicrafts and woven pandanus mats. In Matatufu and Lotofaga, villages on the south coast of Upolu the WIBF set up a green house for the planting and selling of various plants including traditional medicinal plants and the paper mulberry tree for *tapa* making.

The Fine Mat Project

While handicraft production gave rural women an avenue for earning cash, the preservation of the Samoan fine mat provided another opportunity and challenge for WIBF. The original fine mats were considerably softer and finer than the ones ceremonially used today, because of the special species of pandanus (*pandanus tectorius-laevis)* and the more detailed process of preparation and weaving of the leaves. In the past, fine mat weavers would use 10 to 16 strips to the inch as a

measure of the fineness of the weave. When kept for years, the very finely woven mat would resemble a piece of fabric almost the quality of fine silk.

Since 1997 WIBDI has been managing a project aimed at reviving and conserving the art of making the traditional Samoan fine mat. The Fine Mat Project addresses cultural issues and offers rural village women the chance to earn an income while performing an activity that was traditionally considered normal women's work. The programme enables rural women with exceptional weaving skills the opportunity to earn cash on a weekly basis, through producing a fine mat using the traditional methods of preparation and weaving. The sponsorship can be for a period of 8 to 25 weeks, where a weaver can earn a weekly wage of up to ST$100 depending on the level of expertise. Through regular follow-up visits to the villages, WIBDI maintains quality control and ensures the weavers are paid and the sponsors upon project completion, receive a fine mat of exceptional beauty.

The Need for Changes in Village Training

The Ministry of Women's Affairs was established in Samoa in 1991. Through the assistance of consultants and meetings with village women, the Ministry developed work projects for women in 14 priority areas. In the priority areas identified, WIBDI became involved in the Small Business Development, Vocational and Agricultural Training and Employment Opportunities, Women's Unpaid Work, and Arts and Crafts Production. In 1996 the Ministry's Small Business Development project was transferred to WIBDI, with the fine mat component of Arts and Crafts Production playing a critical role in setting up employment for women in the villages while at the same time addressing important issues of cultural preservation.

Working in designated villages, the WIBDI small business training team had continued with the training module developed by New Zealand experts for the Ministry of Women's Affairs. After three years of delivering the training it had become obvious that the module was ineffective in the Samoan context. The WIBDI revised the training module from one delivered in a classroom, to one where people could sit in a *fale* and teach the subject through making it relevant to what villagers were familiar with. WIBDI also realized that the training module had to be delivered with an income generating project as this would enable the participants to become involved in earning an income, while learning to take care of cash.

Many of the women in the WIBDI training programmes were of an age where their last contact with formal learning had been at school, (mainly at the primary level) and issues of commerce were not covered in the curriculum at the time. Participants found it difficult to grasp the fundamentals of planning, saving and budgeting cash when they earned no cash on a regular basis. With no experience of paid employment, or of earning cash, the rural villagers were ill equipped to deal with training on their own. Many participants had no concept of time management, did not see a need to save money, and yet asked for loans without having a source of income to repay the debt.

WIBDI identified that projects had a higher rate of success if consistent follow-up visits were made to the rural villages involved. Through donor assistance, a vehicle was donated to WIBDI to conduct regular weekly visits to nurture the families as they worked on the projects. Field workers observed that many participants would be keen at the outset, only to lose enthusiasm after a few weeks, to then completely dropping out of a programme. One example included WIBDI securing funding of ST$70,000 for an organic farm training and certification project, only to have farms receive full organic certification then stop producing coconut oil. Rural villagers were likewise frustrated by the lack of opportunities available to earn cash where they lived and the limited markets for the products they were able to make. This made it an imperative for WIBDI to find viable projects using the resources of the rural environment, where simple technology could be used to make products for niche export markets.

Viable Projects Using Simple Technology

Through research, experimentation, consultation and assistance from the Government, donor agencies, and other members of the WIBDI network, viable projects for the rural villages were found that included bee-keeping, coconut oil production and organic farming. Earlier studies conducted by FAO identified bee-keeping as a viable small business well suited for rural women in Samoa. A non labour intensive activity requiring minimal time and an opportunity for rural women to engage in a small business activity with earnings up to ST$5.00 per litre of honey. Since the inception of the bee-keeping project in 1997 which has included the distribution of hives and equipment, training workshops and follow-up visits, there are currently 14 villages on the island of Savaii involved with the WIBDI programme.

After searching for viable ideas, including the revival of coconut oil production by village women and youth, WIBDI learnt about the Direct Micro Expelling (DME) technology for the production of coconut oil through a monthly meeting run by the USP regional satellite network for ECOWOMAN.[1] The DME technology was identified as well suited to rural environments for the production of virgin coconut oil and other by-products. The DME system can process 300 to 500 coconuts per day producing 25 to 45 litres of oil with an oil extraction efficiency (OEE) of over 85 per cent of the available oil. In 1995 WIBDI conducted a sub sector analysis of the coconut industry in Samoa, where figures indicated that a ton of copra from approximately 5000 nuts, could earn ST$1135.00 compared with 5000 nuts processed using the DME technology into coconut oil, with earnings of ST$4400.00.[2]

While viable projects were found the issue of marketing the products for niche export became apparent. The virgin coconut oil produced by rural villagers was of such a high quality that expert advice given to WIBDI was to keep the price at a premium as the market would initially compare the coconut oil to copra oil. The WIBDI however experienced difficulty negotiating a premium price for the coconut oil due to the unfamiliarity of the product and the confusion with copra. To enhance the export marketability of the coconut oil WIBDI expanded the project to include organic training and a certification process from a reputable international organization. This initiative proved beneficial with active participation in eight villages and export earnings of ST$98,000 in 2001.

WIBDI and Funding

The WIBDI has been fortunate in developing and maintaining positive relationships with both the Government of Samoa and donor agencies. In Samoa, collaboration between Government, through the Aid Coordinating Committee (ACC), and NGOs has generally been mutually beneficial. Without the vision and support of the ACC however, this collaborative process would not have eventuated. Providing core funding for a NGO as well as funding individual projects was a new donor concept that in Samoa needed the approval of the ACC. The WIBDI has been grateful for the support and confidence of the ACC which have assisted in sourcing core funding for WIBDI. Other relationships with Government include the Ministry for Women, Internal Affairs and Social Development

[1] ECOWOMAN is an NGO network of Pacific women promoting women's involvement in science and technology, and WIBF is the Samoan focal point.

[2] This figure was based on local oil sales using the price of the locally produced coconut oil as the price base.

on the Fine Mat Project and the Ministry for Agriculture, Forests, Fisheries and Meteorology on the Organic Farming Project.

Donor agencies have also contributed to the success of projects providing consistency and follow-up with meeting rural needs. A few examples of which include the NZAID core funding which began in 1995, enabling WIBDI to hire additional staff to work more effectively with people in rural villages. The Oxfam Committee for Famine Relief New Zealand (OXFAM NZ) which have provided funding for three years, for the expansion of the Micro-finance Programme ensuring the weekly nurturing visits of field officers to villagers continues uninterrupted. The Canada Fund has also provided funding for computers and two of the three WIBF vehicles, crucial to the regular visits to families involved in rural projects. Other assistance to WIBDI has come from agencies namely AusAID, UNFAO, UNESCO, UNDP, ADB and USA Peace Corps.

Lessons for the Future

As WIBF has evolved and valuable lessons have been learnt WIBDI acknowledges :

- Samoan rural villagers are part of a cash economy, and yet they are not usually equipped to deal with it where they live.
- Samoan women are more open to earning cash through their own labour and to learning how to manage cash: they do not want to remain dependent on remittances.
- Quantifying and valuing women's labour (weaving especially) has resulted in the women paying due attention to the quality of their work.
- Earning cash gives women a new sense of self-worth, a new negotiated status in their families and a changed standing in the community.
- A cultural change is taking place in Samoan rural villages: many women are now the earners of the cash while the men are producers of the food.

Lessons in Empowerment

Working in the rural villages, WIBDI has learned that in Samoa, every person or family learns at their own pace, and in their own way. The importance of two overriding values and beliefs is that a Samoan model

of development must take into account Samoan values, tradition and culture; and that sustainable change occurs slowly and requires a long term commitment. WIBDI have shown this commitment, by learning from mistakes and using them to create more effective ways to help the rural populations of Samoa.

WIBDI believe the nurturing of rural families must continue until they are capable of making it on their own. WIBDI has often been criticized for the nurturing visits to clients some of which can be justified given the high costs involved. However WIBDI believes that projects have been successful because regular visits to the villages are maintained with the conviction that every person trained needs to develop in her own way.

Income generation is still a foreign concept for many villagers, thus having access to a job, especially in one's own rural environment, can be a liberating but unsettling experience. For the WIBDI project women, there had been no daily provision for an income generating activity. Activities needed to be scheduled around commitments and accepted as a bona fide activity by their husbands or other members of the family. Once it had been accepted, those concerned had to decide what daily activities the women could drop to make time for their paid work. The decisions are rarely easy to make, as most activities are centred on the church and village and have to be negotiated with wisdom and patience.

Marketing of products from rural areas is a problem WIBDI has been struggling with since the inception of the programmes. As a result WIBDI have set up nucleus services centres with personal funding because of limited support specifically aimed at small businesses. There have been many recent developments worldwide in the markets for herbal remedies, traditional or alternative medicines and for organic products. In this time of concern over the effects of the global economy on small island economies, WIBDI are actively seeking ways they can access niche type markets for products from rural environments.

In the years since WIBDI was established the Organisation has grown and contributed to Samoa's economy in a way that many women have, as the people in the background delivering results that benefit their family and community. This work will need continued support from government and donors for expansion and improvement for without such support, the unchanging prospect of a rural environment dependent for survival on remittances.

With further support and the collaboration of other like-minded organisations, WIBDI know through taking simple technologies to the rural villagers of Samoa and offering them income-generating opportunities this will assist rural communities and families out of the poverty they now endure – a poverty of opportunities that inevitably contributes to the cash poverty they have experienced for most of their lives.

4. Tonga

Squash

By
Pousima Afeaki, Tinopai Farm, Tonga

Summary

The squash industry in Tonga is widely regarded in the PICs as a farming and export success story. After only four years of squash growing in 1991 as many as 1,000 farmers exported 21,800 tonnes to Japan in a short 4-6 week period to fill in a gap in squash production by Japan and New Zealand during the November and December period. Tonga has managed to keep that niche market in spite of competition from other PICs. Tongan farmers and exporters have made major investments in inputs, equipment and infrastructure to ensure that its competitive edge has been maintained. However, the squash export industry has not been an unqualified success. It has indeed been a major earner of foreign exchange and has created much employment all the way from the production phase to selling in Japan. However fluctuating prices have forced many small farmers to lose their farms because of inability to pay back loans, and the Tongan government has stepped in to regulate production and ensure quality following complaints from Japan. Now the production end is in the hands of fewer small farmers (i.e., 8 acres each) and more large farmers. Production contracts with the exporters are often used. The exporters themselves are also growing more and more of their own squash. Environmental concerns are increasing in terms of cutting down coconut trees, and continuing use of inorganic fertilizers, and spray chemicals including the related health problems of those spraying. Disease problems are increasing as the crops become resistant to fungicides. Uneasy relationships often exist between governmental regulators, and between farmers and exporters.

Introduction

The squash industry in Tonga is widely regarded by other Pacific Island countries as a farming and export success story. The statistics are impressive. By 1991, after only 4 seasons of squash-growing, Tonga grew and exported 21,800 tonnes of squash to Japan. More than 1,000 farmers were involved in growing the 1991 crop. Each year, on average

since 1991, Tonga has grown and exported 14,000 tonnes of squash to Japan. From this squash, Tonga has earned average gross revenue of TOP16.7 million (USD7.9 million) each year.[1]

The squash is exported in a very short 4-6 week period during October and November each year. Tongan squash fills a gap in the Japanese market (during November and December) between the supply of squash grown in Japan and squash grown in New Zealand. Tongan farmers and exporters have made major developments in infrastructure to enable the volume of squash to be grown, harvested, processed and exported to fill the short gap that is available in the Japanese market.

Other Pacific Island countries, including Vanuatu, New Caledonia and Fiji, have tried and continue to try with limited success, to grow and export squash to Japan, targeting the same November-December gap. Mexico, the USA and Russia have also tried with limited success to export during the same gap. International competition to supply the Japanese squash market is steady but Tonga has managed to retain its position as the leading supplier for the November/December time-slot.

Without doubt, Tonga has earned considerable foreign exchange from squash exports (TOP208 million (USD99 million) gross receipts between 1987 and 2002), but cash-input costs are high and market prices are volatile. On average, half of the gross receipts are remitted back out of Tonga to pay for imported inputs including, seeds, fertiliser, chemicals, wooden bins, and freight to Japan.[1]

Prices paid to Tongan farmers for squash have averaged TOP0.50 (USD0.24) per kilogram between 1987 and 2002, but fluctuate greatly from year to year. In 1993, prices paid to farmers reached TOP1.00 per kilogram, then plummeted to TOP0.20 in 1994. In 1999, farmers again received only TOP0.20 per kilogram, but by the 2001 season, prices spiked to TOP1.40.[1] Fortunes have been made and then lost by Tongan squash farmers and exporters as prices have seesawed between seasons.

From a social and economic perspective, the squash industry has been very good for Tonga. The industry provides employment and income for thousands of Tongans each year across the whole spectrum of the economy, including farmers, farming-services contractors, harvest workers, processing and packing workers, transport and fuel operators,

[1] Tonga Development Bank Squash Report, 2002

wharf services, shipping, food-providers, and of course, banks and financial institutions. These benefits have however, been mainly restricted to the two large island groups of Tongatapu and Vava'u where squash is grown. Squash is not grown in the small island groups of Ha'apai and the Niuas so these islands have not received direct benefits from the squash industry.

The environmental impact of the squash industry in Tonga is not so good. Many farmers have cleared the trees on their farms (including coconuts) to provide space and light for squash to grow. In addition, squash needs intensive fertilising and spraying of insecticides and fungicides to grow well. In the longer term, the use of inorganic nitro-phosphate fertilisers and of chemical insecticides and pesticides will have a detrimental effect on the environment. Squash farmers who have been careless with or who were ignorant about poisonous chemicals have become sick.

Background

The squash industry in Tonga was instigated by Hon Mailefihi Tuku'aho, a nephew of the King of Tonga. Mailefihi perceived there was an opportunity for Tonga to grow and export squash to fill the November/December gap in the Japanese market. He organised funding for farmers of the first squash crop in 1987 through the Tonga Development Bank (TDB). In 1987, 40 farmers grew and exported the first export crop of 153 tonnes to Japan.

Despite the tiny output of the first year and the losses that resulted, Mailefihi and the farmers continued. Two years later in 1989, 164 farmers were growing squash and exports had reached 3,000 tonnes. By 1991, there were more than 1,000 farmers involved. Those farmers grew 6,000 acres of squash which was funded by the TDB at a cost of TOP4.5million (USD2.1million). 21,800 tonnes of squash was exported in 1991 and farmers received up to TOP0.80 (USD0.38) per kilogram.[1] 1991 was a peak year for Tongan squash exports in both volume and price.

The 1991 season confirmed squash as a major new export industry for Tonga. The squash industry became a partial replacement for the once-thriving copra, banana and vegetable export industries that had been lost to Tonga during the 1970s and 1980s. Major investments were made in the squash industry by farmers, exporters and others involved.

[1] Tonga Development Bank Squash Report, 2002

Tractors, sprayers, fertiliser-spreaders, planting machines and other farm equipment were purchased and imported by farmers. Packing sheds were built by exporters who also bought processing machines, forklifts, trucks and other equipment needed to process and export squash.

The record volume of squash exported during the 1991 season resulted in complaints from Japanese importers about the quantity and quality of Tongan squash arriving in Japan. As a result, Tongan Government agencies began implementing more control over the industry. Prior to this the industry had been unique in Tonga as an example of an industry created and controlled by the private-sector. Government involvement was limited to Quarantine inspections of exports. In 1992, the Tongan Government instituted a stricter Quarantine inspection system for squash exports. In addition, new specific powers were given to the Ministry of Labour, Commerce and Industries (the Ministry) to control squash-farmers, exporters, and export-volumes.

In 1994, a record number of farmers (1,459 funded by the TDB alone) grew squash. The Minister of Labour, Commerce and Industries decreed an export quota of 15,000 tonnes, citing protection of prices for farmers as the reason for the quota. The record number of growers and favourable growing conditions meant that at least 21,000 tonnes of squash was available for export.

Despite protests and street marches from farmers and exporters, the Tongan Government enforced the quota. Only 16,545 tonnes were exported and farmers received an average price of TOP0.25 (USD0.12) per kg, the lowest price paid except for the first year in 1987. Most farmers were able to sell only part of their exportable squash. Some farmers were not able to sell any of their crops. Thousands of tonnes of extra squash rotted in the fields and towns and bred so many millions of flies that the Health Department had to run a fly-control programme. Hundreds of farmers were unable to repay their loans and farm mortgagee-sales soared in the following years, 1995 and 1996.

The Ministry continues to exert control over the squash industry in Tonga but has taken a more conciliatory approach since the quota disaster of 1994. Exporters require licences from the Ministry which are reviewed annually. The Ministry requires exporters to agree on target export-volumes and minimum prices for farmers. There is much dissatisfaction with the system which is criticised by farmers for not protecting their interests, and by exporters for not allowing them to compete fully and freely.

The squash industry is into its seventeenth year in 2003 and is now a mature industry. Industry infrastructure is fully developed. Farmers use their own equipment or can hire farming-services contractors to carry out soil preparation, planting, fertilising, weeding, spraying and harvesting work. Exporters have packing and processing sheds with all the equipment needed to process squash for export. Exporters and farm-supplies shops import and sell seeds, fertilisers, chemicals and other supplies needed by farmers to grow squash. Funding for farmers is provided by the TDB and other commercial banks. Exporters also fund farmers on a contract-farming basis.

Squash farming begins each year in February/March with a first-ploughing of squash blocks. Soil-preparation continues with planting starting in late June. By August most planting has been completed. Squash is a very fast-growing crop taking only 80-85 days (11-12 weeks) from sprout to harvest. Fertilisers are applied, weeding is carried out, and insecticides and fungicides are sprayed every 2 weeks following planting until harvest. The first harvests are made in late-September and harvesting continues to mid-November.

Processing and packing begins at the start of October and is usually finished by the third week of November. The first ships arrive early in October and begin loading as the filled export bins are delivered to the wharves. The ships are cargo vessels chartered by the exporters, with cargo capacity of between 1,500 and 3,000 tonnes. Each year, 6 to 8 ships are chartered to ship squash to Japan. The first ship usually sails by the third week of October. The last ship is gone by the end of November. By then, on average, 28,000 wooden bins each filled with 500 kg of squash will have been packed, loaded and shipped to Japan.

During the 8-week period when harvesting, processing, packing, and shipping happens, activity on the main island of Tongatapu and nearby ‘Eua is hectic. Thousands of people are involved in harvesting, processing, packing, building squash bins, transporting squash from farms to packing sheds, and from sheds to the wharves. The wharves load day and night as the harvests proceed. Take-away food shops and other food-suppliers sell out of food each day feeding all the workers. Road traffic is constantly held up by slow-moving convoys of trucks and trailers loaded with squash.

The squash industry was initially based on the large islands of Tongatapu and Vava’u which have deep-water wharves for cargo ships to dock. The smaller island groups of Ha’apai and the Niuas do not have deep-water ports and squash is not grown there. The trend since 1999 has been for

squash-farming to be mainly carried out on Tongatapu and the nearby island of 'Eua. The volume of squash being grown and exported from Vava'u has declined to the point where it is no longer economic for cargo vessels to call and load at Vava'u. Instead, the limited amount of squash available from Vava'u is shipped to Tongatapu on domestic ferries for re-loading onto the squash cargo ships.

Squash farmers are facing increasing problems with disease-control. Over the years of squash-farming, diseases have become endemic in Tonga. The diseases are becoming resistant to fungicides. One disease in particular, powdery mildew, is becoming very difficult to control in the late-season plantings when the weather is getting hotter and more humid. Powdery mildew spreads very quickly if not controlled. It can destroy a farmer's crop in less than one week. Farmers are therefore shifting their plantings to the earlier, cooler and less humid part of the season but have to use higher doses of chemicals to control powdery mildew. Disease is becoming a very real threat to the future of the squash industry.

From an environmental perspective, there is no doubt that in the longer term, there will be adverse effects from the continuing use of inorganic nitro-phosphate fertilisers and spray chemicals. Residues will eventually leach into and contaminate the underground water-table and the sea. Residues have not yet reached levels to cause concern. A four-year study between 1998 and 2001 of the internal lagoon on Tongatapu by the Department of Environment, revealed very low traces of spray chemicals but relatively high levels (although not harmful) of nitrates and phosphates.[2]

The Department of Environment is putting together plans to control pollution of the land and sea. These plans will include restrictions on the use of inorganic fertilisers and spray chemicals by Tongan farmers in the future.

Small-Farmer Experiences

In the first ten years between 1987 and 1996, the squash industry was predominantly based on supply from small farmers growing squash on their standard Tongan 8-acre farms. The number of farmers growing squash peaked in 1994 when the TDB funded 1,459 farmers. This is a very large number given Tonga's total population of only 96,000 and shows how widespread squash-farming had become in Tonga after only 8 years.

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[2] Environmental Management Plan for Fanga'uta Lagoon System – Part 2, May 2001

Tongan farmers were able to take up squash farming very quickly because of two contributing factors, land tenure and funding. Tongan farmers own their own land under Tonga's unique 'perpetual' leasehold system. Individual land ownership means that Tongan farmers are free to use their land as they want, instead of being restricted by communal or chiefly dictates. Tongan farmers therefore grow crops which they consider will give them the best return or profit. To raise funds to grow those crops, Tongan farmers are able to put up their land as security with the banks.

When farmers realised that they could make money from squash, they raised loans and began farming squash themselves. By the fifth squash season in 1991, 1,000 farmers had already taken out loans and were growing squash.

Since 1994 however, there has been a gradual decline in the number of small farmers growing squash. The decline began after the quota disaster in 1994 when many farmers became disillusioned and stopped growing squash. Other farmers who could not repay their 1994 squash-loans had their farms sold up by the banks. Between 1995 and 2002, the number of farmers funded by the TDB fell from 833 in 1995 to 160 in 1999, then to 136 in 2001 before climbing to 303 in 2002.

Many squash-farmers do not receive funding from the TDB. Instead, those farmers are self-funded or are funded by squash-exporters. However, the trend over time has been for fewer small farmers and for more large farmers. In particular, the squash-exporting companies have themselves been growing more and more of their own squash on large blocks of 100-200 acres.

The main reason for the gradual decline in the number of small farmers has been the volatility in squash prices from year to year. Farmers face both farming risks (drought, disease, insect pests, and weeds) and market risk (price at time of harvest) for any crop they grow. When prices fluctuate greatly, market risk increases to the point that farmers do not grow. Squash prices for Tongan farmers have fluctuated hugely over the years. For example, farmers received the highest price ever of TOP1.40 (USD0.67) per kg in 2001, but got only TOP0.40 the year before in 2000, and TOP0.20 in 1999.

Given an average farming cost of TOP0.40 per kg of squash grown, farmers need a price of at least TOP0.60 per kg to make the crop viable. There have been many seasons when this price has not been reached

and as a result, hundreds of farmers have given up growing squash. Unfortunately, exporters in Tonga have not been able to arrange a guaranteed minimum price for squash with importers in Japan. As small farmers have stopped growing, the exporters themselves have had to grow more squash on large acreages (100-200 acres) to make up the export tonnage needed each year.

The farmer-exporter relationship has not been a happy one over the years. Farmers have been dissatisfied that exporters cannot arrange a guaranteed minimum price for squash and consider that the exporters' margins are excessive at the farmers' expense. In an effort to rectify this, three groups of farmers have set up their own cooperative squash-export companies since 2001. These cooperatives have not yet had any success in achieving the guaranteed minimum price of TOP0.60 that farmers want set at the beginning of each season. The farmers involved in the cooperatives have learnt about the difficulties involved in exporting and trying to set a minimum price.

Although many small farmers have stopped growing squash, they have continued to grow other crops using the equipment and knowledge gained from squash-farming. In this way, squash-farming has lead to a major increase in farming overall by Tongan farmers. Prior to squash-farming, commercial farming opportunities were very limited for Tongan farmers and most farms were left fallow or were farmed on a subsistence basis to provide some food for families. Since the advent of squash in 1987, hundreds of people have returned to farming. They began with squash and have diversified into other commercial crops such as vegetables, root crops, kava and vanilla. Farming is once again regarded as being able to provide a livelihood.

The equipment gained by Tongan farmers from growing squash means that they are probably the best-equipped small farmers in the Pacific Islands. Most Tongan farmers have their own knapsack sprayers – both hand-pump and motorised. Many have their own trucks and rotary hoes. Many also have their own tractors which are available for hire by other farmers. Tongan farmers have quickly adapted the use of squash equipment to other crops. It is now common to see farmers using knapsack sprayers to spray their taro, kumala and yam crops. Harrowing machines and rotary hoes for weeding squash are used to weed other crops.

Squash-growing is becoming increasingly mechanised with planting, fertiliser-spreading, weeding, spraying and harvesting, all being carried

out using tractor-operated machines on large farms. Small farmers use a mix of small and large mechanical equipment to grow their squash. For instance, ploughing and land-preparation will be done by tractor. Planting may be done by hand or using a planter. The farmer might spray using his own knapsack or he might use a tractor sprayer. Fertiliser spreading may also be by hand or by tractor. Weeding is fastest by a tractor with harrow. Harvesting and sorting is usually by hand using family labour.

The use of chemical sprays by farmers is a feature of squash-growing. Squash is susceptible to many insect pests and diseases and cannot grow well without spraying. In addition to insecticides and pesticides, farmers also use weedkiller sprays to tend their squash. Farmers are no longer ignorant of the dangers of chemicals but unfortunately, many farmers are careless about the use of chemicals. It is common to see farmers spraying squash and other crops with a knapsack and wearing no safety gear except for a scarf over the mouth. If asked why no safety gear, the farmers' usual reply will be that it is too hot to wear the gear.

As a result of unprotected spraying, farmers have become sick from the poison chemicals. Despite this, many farmers continue to spray without bothering to use proper safety gear. In the longer term, more of those farmers will also become sick. To prevent this, the Tongan Government will probably have to pass laws to force farmers to use proper protection when spraying.

Exporter Experiences

While the number of small farmers growing squash has fallen over time, the number of squash-exporters has increased dramatically. The Ministry of Labour, Commerce and Industries issues licences to squash exporters. Over the years, the Ministry has issued more licences to squash-exporters. In 1994 there were 6 licenced exporters. In 2003, there are 15. Those 15 exporters include 3 cooperatives of farmers who grow and also export squash.

For their supply of squash, exporters use contract-farmers (usually small farmers) and also grow their own squash. Funding for contract-farmers is usually arranged through the TDB. Funding for the exporters' own crops is usually provided through advances from New Zealand squash-marketers or guarantees (in the form of Letters of Credit) from Japanese importers, and also from Tongan banks.

Advances from New Zealand marketers are made to Tongan exporters by way of supply of seeds, fertiliser, chemicals and wooden bins. In return, the Tongan exporters agree to let New Zealand marketers arrange and handle the sale of Tongan squash to Japan. The New Zealanders charge a 5% marketing fee on the gross value of exported squash and then deduct the advances made as well as other expenses including freight, before remitting the balance to the Tonga exporters.

Some Tongan exporters also deal directly with Japanese importers and use Letters of Credit from the importers to fund squash-growing and exporting costs. The majority of Tongan squash funding however, is through New Zealand marketers.

When arranging deals with contract-growers, the exporter and the farmer agree that the farmer will grow squash with assistance from the exporter and then sell that squash to the exporter. The exporter supplies seeds, fertiliser and chemicals to each of its growers. The exporter is paid for these inputs by the grower with some of the loan taken out by the grower from the TDB. The price paid by the grower for these inputs includes a margin added by the exporter. The exporter then, makes two sets of money from the farmer, the first for inputs supplied and the second as a margin on the value of the squash actually exported.

This 'extra' margin for inputs has been a sore point with farmers who consider that the exporters already make enough money from the export margin applied by exporters. Resentment about the 'extra' input margins coupled with the inability of exporters to guarantee a viable minimum price has caused discontent by farmers with exporters. The relationship between contract-farmers and exporters is therefore not a happy one.

At harvest time, contract-farmers frequently shop around and sell part of their squash to other exporters offering a better cash-price. Exporters have sued contract-farmers for not complying with the exclusive-supply condition of their agreements. Farmers continue each year to disregard their contracts. Exporters also sue each other for squash 'poaching' from non-contracted farmers. The industry spawns many court cases for lawyers to benefit from.

Conclusion

The squash industry in Tonga has entered the mature stage of its life cycle. Whether the industry continues to sustain itself or begins to decline will depend largely on the efficiency gains that may be achieved

to reduce farming and exporting costs. One major problem already occurring is the steady loss of potency of current chemicals to control disease. If yields decrease over time from disease, the industry will decline.

From an environmental viewpoint, squash-farming will have detrimental effects in the longer term. Residues from inorganic nitro-phosphate fertilisers and spray chemicals will leach into the underground water-table and into the sea. As yet, residues have not yet reached levels that cause concern but the Department of Environment is drawing up plans for controls of pollutants. These plans will affect the use of inorganic fertilisers and sprays by farmers for squash and other crops.

From a social and economic perspective, the squash industry has been an over-whelming success. Thousands of people have earned income each year for the past 15 years. Farmers who returned to farming to grow squash gained equipment and knowledge which they have used to grow other commercial crops. Tonga's squash industry has faced many challenges including droughts, over-supply, international competition, Government over-interference, and farmer/exporter friction, and has managed to survive. The industry has proved resilient and will meet future challenges as they arise.

Root Crops

By
Pousima Afeaki, Tinopai Farm, Tonga

Summary

Unlike the squash export industry government involvement in exporting root crops (i.e., cassava, taro and yams) has been minimal. Their involvement is confined to government quarantine officials carrying out inspections of the products being exported and the export promotion officials providing marketing information about root crops – and other products – to exporters and overseas importers This case study, illustrates issues relating to exporting such crops. Exporters, who may be farmers themselves, buy from farmers and export crops in fresh, chilled or frozen form – depending on the type of root crop. The market in importing countries mainly consists of expatriate Pacific Islanders, Asians, and sometimes Hispanics. Sometimes the importers are relatives of the exporters, although cash flow issues are usually less of a problem with commercial importers. Refrigerated containers for exporting root crops are not a problem because most of the meat eaten in Tonga is imported. Spray chemicals to control weeds and pests on root crops is becoming more common – although root crops in Tonga do not have many serious insect pests or diseases. There are sometimes issues of over supply of root crops in importing countries thus further supporting the idea of dealing with commercial importers who are likely to have a better idea of their local markets. The case study illustrates the importance of commercial root crop exporters being honest, hard-working, persevering, fluent in English, innovative and flexible in dealing with the problems that arise. They also need to establish relationships with importers based on trust and delivering on time. This means fulfilling previous agreements even when unexpected family and societal obligations might be an issue. This highlights the tensions that arise between operating successfully in a global society and those relating to maintaining the Pacific Way of Life.

Introduction

Sione Hifofua breathes a sigh of relief. The container of frozen cassava his family have been working to fill for two long weeks, is at last hoisted over the ship rail and set into place. Twelve tonnes of frozen cassava, six hundred 20-kilogram sacks of cassava, all finally frozen, packed, stacked and ready to set sail from the Tongan capital, Nuku'alofa to

Auckland, New Zealand.

It has been a long project. Sione had visited his brother Maka who lives in Auckland, two years earlier. On that visit, Sione and Maka came up with a plan to export a container of frozen cassava from Tonga to Auckland. Sione would grow cassava, process it and send a container of cassava to Maka who would distribute and sell the cassava to Tongans living in the Auckland area. Two years later, the cassava has been grown, processed and packed and the container is on its way.

Sione's cassava scheme with his brother Maka is a first-time venture for both of them. Both Sione and Maka know of other Tongans who have done the same thing. Sione and Maka hope to make good money from their cassava. They have heard of people making good money and also of people who have lost money. Sione and Maka plan to do another container of cassava next year if this venture makes money.

Pulu 'Aoniu checks his list again. There are still seven more farmers to deliver their taro for Pulu's workers to check, weigh and pack into the refrigerated container. The container is two-thirds full of taro which Pulu has been buying for the last 2 days from farmers on Vava'u island. The ship is due to dock the next day at Neiafu on Vava'u, and will load Pulu's container to ship to Pagopago, American Samoa. Pulu needs another 170 50-pound (22kg) sacks of taro to fill the container. He hopes the farmers will bring the taro they promised.

Pulu is a commercial exporter. He buys taro from farmers on Tongatapu, the main island, and from Vava'u farmers. Pulu exports taro to his uncle in Pagopago. His uncle, Kaka, migrated there 30 years ago and married and settled in American Samoa. Kaka supplies taro to the hospital, schools and large shops in Pagopago. Kaka usually imports one container each month from Pulu in Tonga. Pulu is able to pay cash on delivery to farmers because Kaka sends money to buy the taro. Farmers like dealing with Pulu because he pays cash up-front. Some exporters pay part up-front in cash and promise to pay the rest later.

In addition to exporting, Pulu also grows taro. He grows taro on his standard-size Tongan farm of 8 acres in Vava'u where the rainfall is more reliable. Pulu works on planting an acre of taro each month so he has some taro to export each month. Pulu's taro makes money for him and also provides a base-supply of taro to help fill the monthly containers to Pagopago. Pulu is a progressive farmer and he is planning to irrigate his taro to help ensure the yield of his taro during droughts.

Background

Sione Hifofua and his brother are not real people. Nor are Pulu 'Aoniu and his uncle Kaka. However, they are real-life examples of how Tongans go about exporting their root crops. Exporting of root crops is carried out by a mix of entrepreneur farmers who do direct deals with Tongans living overseas, and also by commercial exporters who export regularly to commercial importers.

The root crops being farmed and exported from Tonga are taro, yams, cassava, tarua taro (xanthosoma), and giant taro (alocasia). The root crop export industry has grown enormously over the past 20 years. Demand for root crops from the Pacific Islands has grown in Australia, New Zealand and the USA (including American Samoa and Hawaii) as immigrant populations of Pacific Islanders (and Asians and Hispanics) have increased. The migrants want to eat their own food and can afford to buy it imported.

Over the ten-year period between 1993 and 2002, Tonga exported, on average each year, 2230 tonnes of fresh and frozen root crops. Figures for the last three years (2000, 2001 and 2002) show dramatic increases from 2685 tonnes in 2000, to 4,103 tonnes in 2001, to 5,276 tonnes in 2002. Although these export figures are still a lot lower than for squash (with average annual exports of 14,000 tonnes), the root crop export figures show that the root crop industry in Tonga is thriving.[3]

The root crop industry is competitive. Commercial exporters vie with entrepreneur farmer-exporters to export root crops. Farmers have a choice of selling in the local Tongan market, or selling to commercial exporters, or arranging to export by themselves directly to Tongans overseas. Root crop prices in the local market reflect the prices offered by commercial exporters to farmers for their produce. Entrepreneur farmer-exporters force commercial exporters to keep their export margins low so they can pay higher prices to farmers. If farmers think the prices offered by exporters are too low, they can export themselves. Root crops from Tonga also compete with root crops exports from other Pacific Islands.

The overseas markets for root crops from Tonga are New Zealand, Australia, American Samoa, Hawaii, and the USA. These countries have significant populations of migrant Pacific Islanders, including Tongans, and other migrant groups such as Asians or Hispanics who

[3] Tonga MAF Quarantine Division Annual Reports and Tonga Development Bank Squash Report, 2002

also eat tropical root crops. The markets are not large ones and are easily flooded by over-supply of root crops. Over-supply happens regularly and prices fall. For farmer-exporters who do not have secure export-price arrangements, this leads to losses and disappointment.

Government involvement in the root crop industry is low. MAF Quarantine inspectors carry out inspections of root crop exports. In addition, Tonga Trade, the export promotion section within the Ministry of Labour, Industries and Commerce, provides marketing information about root crops (and other products) to exporters and overseas importers. The Tongan Government has set up storage facilities and a market in Pagopago for Tongan root crops to be stored and sold. Farmer-exporters would like the Government to set up similar facilities in New Zealand, Australia and the USA, and also for the Government to guarantee export prices.

Farming of root crops for export is carried out on all the main island groups of Tonga except for the small and remote Niua group. Root crops are mainly grown by small farmers on their own 8-acre farms. Commercial exporters also grow root crops but on a larger scale using blocks of leased land. Tongan farmers use a combination of machines and labour to grow their root crops. Tractors are used for soil preparation work. Planting is done by hand. Weeding may be by hand, or by spraying of weedkillers, or by tractor and harrow. Harvest and processing are done by hand.

The use of spray-chemicals to control weeds and insect pests on root crops is becoming more common. Fortunately, root crops in Tonga do not have many serious insect pests or diseases so chemical sprays are only used by farmers when necessary. In contrast, Tonga's major export crop, squash, needs intensive chemical spraying every 2 weeks to stop insects and diseases. The use of inorganic nitro-phosphate fertilisers is not yet common for root crops in Tonga. Farmers are however, beginning to experiment by applying NPK fertilisers to increase yields of their root crops.

All the major root crops grow well with some shade. Root crop farmers therefore, do not need to clear trees off their farms. Droughts are a serious and regular problem for Tongan farmers. Root crops, especially taro, tarua taro and giant taro, survive better through droughts if there is some shade from trees for protection from the sun. Farmers prefer to grow those crops where there are trees to give some shade. This helps to stop trees being cut, including coconuts, on Tongan farms.

Root crops are processed to export fresh or frozen. It is easier to process root crops for export in fresh form. Taro, tarua taro, and giant taro all store well when chilled. Yams store best at room temperature. To process these crops for fresh export, the tubers first have surface roots and fibres cleaned off. The tubers are then washed, dried, weighed and packed into sacks, cartons or wooden bins which are stacked into refrigerated 20-foot containers to ship overseas. The processing is all done by hand and needs a lot of labour and workers.

Taro, tarua taro, and giant taro are shipped chilled at between 8 and 12 degrees Celsius. Yams are best shipped at temperatures of between 16 to 18 degrees. Tongan root crop exporters now use refrigerated containers as a matter of course. Chilling allows the root crops to arrive overseas in better condition and also reduces rotting and insect infestation. Importers have less hassles with Quarantine inspections when root crops arrive chilled.

Cassava cannot be stored fresh and must be frozen for exporting. Processing of frozen produce is more complicated than for chilled produce. To process frozen cassava, the cassava is first peeled, then chopped into standard sizes, then washed before weighing and packing into sacks or plastic bags. The sacks or bags are then taken to be frozen in a blast-freezer or are frozen by being spread along the floor of a refrigerated container. After freezing, the frozen cassava is stacked in the refrigerated container which is set at –20 degrees Celsius. Filling a container of frozen cassava takes between 5 and 10 working days. Frozen processing needs even more labour and workers than fresh processing does.

More recently, root crop exporters have begun to also process and freeze taro and giant taro for export to the USA. It takes up to 4 weeks for root crops to be shipped from Tonga to the USA so fresh exports are less likely to arrive in good condition. Freezing ensures storage and avoids any Quarantine problems.

There is a steady supply of refrigerated containers available for root crop exporters because most of the meat eaten in Tonga is imported. The meat is imported frozen in refrigerated containers which used to be sent back empty. The increase in root crop exports in refrigerated containers has led to competition between the shipping companies to supply exporters who are filling refrigerated containers for the return trip.

Exporting Experiences

Manu 'Ufilei and his wife Seini run their own farm and root crop export business on the main island of Tongatapu. Manu and Seini have been farming for 15 years and began exporting 10 years ago. They began exporting by growing and filling a container with yams which was exported to Auckland, New Zealand, in 1993. That first container of yams was sent to an uncle of Manu living in Auckland, to distribute and sell. It took the uncle four weeks to distribute the yams to customers in Auckland. It then took another four months for the uncle to collect payment from customers. In the end, Manu and his uncle agreed to not waste any more time trying to collect money owed. Only two-thirds of the money owing was collected. That was enough to cover costs but no profit was made.

Manu and Seini learnt a valuable lesson from that first container of yams. Distribution overseas is hard work. Collection of money overseas is also difficult and uncertain. To run a viable export business, distribution and payment needs to be secured by dealing with a commercial importer. Manu travelled to Auckland the next year in 1994 and visited commercial importers of root crops from the Pacific Islands. He made a deal with an importer to send a trial shipment of mixed root crops from Tonga.

The first trial commercial order was for a mix of yams, taro and tarua taro. Manu had his own yams but had to buy the taro and tarua. To get the money to buy the taro and tarua, and to cover his processing and packaging costs, Manu saw his bank manager and arranged a loan of TOP5,000 (USD2,380). Manu's bank manager was familiar with Manu's farming business and was satisfied with the written order for root crops from the New Zealand importer.

Manu only had two weeks to fill the first trial order and had to rush to complete the export work on top of his normal farming work. It was difficult to find farmers who had taro and tarua ready for harvest. By the time Manu finally found farmers there were only 5 days left until the ship arrived. The farmers were busy with other work so Manu had to hire 5 workers to harvest the taro and tarua. He also hired another 5 workers to process the yams, taro and tarua. In the race to be ready for the ship, Manu and his workers ended up working for 24-hours straight through the night. As the ship docked that morning, the final cartons of yams and sacks of taro and tarua were stacked into the container.

The first trial commercial shipment was sent in a non-refrigerated container. When the produce arrived in Auckland, it was damp with condensation. The Quarantine inspectors found insects living in the yams and taro and ordered the container fumigated. Despite the dampness and fumigation, the importer was satisfied with the quality of the yams, taro and tarua sent. The importer faxed Manu an order for a second container of mixed root crops.

Manu went to see his bank manager again to ask for more money to fill the second order. Under Manu's agreement with the New Zealand importer, Manu would be paid three weeks after the container was cleared through Quarantine and Customs. This was to give the importer time to check the shipment for any reject and rotten produce. In the meantime, Manu had the second order to fill for a ship in three weeks time and needed money to buy more taro and tarua before he was paid from New Zealand. Manu's bank manager was satisfied with the second order and let Manu borrow another TOP5,000.

Manu and his workers began work on the second container. Manu learnt from the experience of the first container and immediately began advertising on the radio for taro and tarua. Within four days he had arranged for seven farmers to supply taro and tarua for his workers to process in the week before the ship was due to arrive. In the week between, Manu and his workers harvested and processed yams from his farm. They then processed the taro and tarua supplied by other farmers during the week the ship was due.

All the root crops were ready and packed and stacked into the container one day before the ship was due to dock. The Quarantine inspectors checked the produce and found mites on the yams. Manu was confronted with a choice of unpacking and reprocessing the yams (which would take at least 3 days) or fumigation in Tonga before shipping. Manu rang the New Zealand importer to let him know what Quarantine had decreed. The importer agreed to accept the shipment with fumigation in Tonga on the same conditions of claims for rejects and rotten produce.

The second container was fumigated in Tonga and then loaded for Auckland. This time, Manu arranged for one door of the container to be left open during shipping for ventilation. On arrival in Auckland, the inside of the container was dry and no insects were found by Quarantine. The importer was again satisfied with the quality of the produce and faxed an order for a third container of mixed root crops to Manu.

During this time, Manu had received payment for the first container. Manu had sent an invoice set out in New Zealand dollars for the FOB (Free on Board) value of the produce, as agreed with the importer. Manu and the importer had agreed that the importer would pay the freight for the container on its arrival in Auckland. Manu had agreed to be paid in New Zealand dollars and to bear the risk of currency movements. Manu had also agreed that the importer would make deductions before payment for fumigation costs and for reject and rotten produce.

The importer paid Manu for the first shipment after deducting for the fumigation costs, and for rejects and rotten produce found. Manu had also agreed to supply produce at a discounted price to win the trial order. When Manu added the fumigation costs and then the extra labour costs for harvesting and processing, he worked out he had lost money on the first shipment.

There were fewer claims for reject and rotten produce for the second shipment. However, Manu had to pay for fumigation in Tonga and for the extra work involved in unloading and re-stacking the yams. Manu figured he covered his costs and broke even on the second shipment.

By the third shipment, Manu and his team had improved a great deal at processing and exporting. Farmers were contacting Manu to ask when his next shipments were. Manu was able to start setting up a schedule showing when farmers had yams, taro and tarua available for harvest and purchase. Manu had also hired 3 more fulltime employees to work on the farm and also on root-crop exports. Those 3 workers brought the workforce up to 9 workers including Manu.

The third shipment was easier than the first two. There was no fumigation and the importer was very happy with the quality of the produce sent. The importer then asked if Manu could send a fourth shipment of two containers, the first of mixed root crops, and the second of frozen cassava.

At this stage, Manu had been paid for the first and second shipments and had repaid those loans to the bank. He had taken another loan of TOP5,000 for the third shipment. Manu calculated he would need another TOP5,000 to fill the fourth mixed root crop container plus another TOP8,000 for the frozen cassava container. Manu decided this was too much to ask from the bank and asked the importer for help by way of an advance. The importer agreed to send Manu an advance of TOP 8,000 for the cassava. The bank agreed to lend another TOP5,000 for a fourth container of mixed root crops.

Manu knew of other people who had processed and exported frozen cassava but had no experience himself. He visited an uncle who had exported frozen cassava before to get help. Manu talked with his uncle about processing cassava and worked out the different steps involved starting with harvesting through to packing the container. Manu drew up a list of workers and equipment necessary for each processing step. He figured he would need 35 workers to work in four different groups: a harvesting gang of 10 workers; a peeling gang of 10; a washing and packing gang of 10; and a transporting, freezing and stacking gang of 5.

Manu agreed with an aunt and her husband to buy and harvest their crop of cassava. He arranged workers for the different work groups and equipment including washing tubs, drying tables, and packing tables. He also arranged for two refrigerated containers to use as blast freezers. Manu needed ten tonnes of frozen cassava to fill the container. He planned to fill the container over five working days by processing 2 tonnes each day. Once the cassava container was filled, Manu and his permanent workers would move on to fill the mixed root crop container the next week, so that both containers were ready for the ship at the end of that week.

The cassava harvesting gang under supervision of Manu's assistant foreman, began work at daybreak on the Monday. At 8am, the transport gang delivered the first truckload of harvested cassava to Manu's farm and the peeling group swung into action. Cassava washing and drying began soon after. Manu's foreman was in charge of the peeling and washing/packing groups. Manu's job was to move between the different worksites and trouble-shoot.

By midday, the first day's harvest was completed and delivered. At the same time, the first batch of processed cassava was being weighed and packed into onion netting sacks. The transport/freezing gang spread the batch along the floor of the first refrigerated container to freeze. By 3 pm, the day's peeling was finished, and the third batch of cassava was ready for freezing. Half of that batch went into the first container and filled the floor. The second half went onto the second container floor. At 6 pm, the fifth and final batch of the day was spread along the floor of the second container to freeze. By 7pm, the worksite was cleaned up and the day over.

After reviewing the day's work with the foreman and assistant foreman, Manu decided to shift two workers from the peeling gang to the washing/packing gang to speed up the washing and packing work. The peeling

work had finished early at 3 pm but the washing and packing had run late finishing at 6pm. Otherwise, the first day had run very smoothly and Manu was pleased. The four work-gangs had all done their different jobs and knew what to do the next day. The first two tonnes of cassava, 100 20kg sacks, was being frozen in the two containers.

By the next morning, Tuesday, the cassava in the two containers was frozen to –20 degrees Celsius. After picking up and delivering the first truckload of harvested cassava, the transport/freezing gang unloaded the frozen cassava sacks from the containers. The frozen cassava was driven to the wharf and restacked into a third refrigerated container which would be shipped to New Zealand. The rest of day's work ran smoothly. With two extra workers, the washing and packing gang finished their work an hour earlier at 5 pm, The worksite was cleaned up and the day done by 6pm.

On Wednesday morning Manu encountered the first hiccup. On his visit to check the harvesting work, Manu noticed that almost two-thirds of the cassava block had been harvested. At that rate, there would be enough cassava for Thursday's processing but none for Friday, the fifth and final day. Manu immediately began looking for more cassava. He managed in the afternoon to find another farmer with cassava ready to harvest and who agreed for Manu to buy and harvest the cassava. The Wednesday processing work went smoothly and by 6pm, another 100 sacks were being frozen.

The harvesting gang finished harvesting the first cassava block on Thursday morning and shifted to the second block to top up the cassava needed for the day's processing. In the meantime, the third truckload of frozen cassava had been loaded into the container at the wharf which now contained 300 sacks of frozen cassava. At the end of the day, another 100 sacks had been processed and were being frozen in the two containers on Manu's farm.

The second hiccup hit on Friday morning. One of the two containers at the farm broke down overnight. The cassava inside was not frozen and had gone mouldy. Fifty sacks, one tonne of cassava was ruined and now needed to be replaced. Manu talked with the workers and they agreed to work a longer day so the lost production could be made up. The broken container was fixed and Manu arranged for a third container at the wharf to freeze the extra third tonne of cassava. Processing of the three tonnes took until 10pm. Manu paid off his tired workers and shouted them a takeaway BBQ each for dinner.

On Saturday morning, the two tonnes of frozen cassava from Manu's farm was taken to the wharf and stacked into the shipping container. The third tonne frozen at the wharf was unloaded and stacked. The container was full – 500 sacks of 20kg – 10 tonnes of frozen cassava. Manu and his workers were relieved they had a Sunday to rest before getting into the mixed root crop container on Monday.

Manu and his crew filled the container of mixed root crops. The two containers were of frozen cassave and root crops were shipped to Auckland. Between 1994 and 2002, Manu packed and exported an average of 20 containers of root crops each year to New Zealand and Australia. Manu visited Sydney in 1995 and made arrangements to also export root crops to an Australian importer.

The exporting game has not been an easy one for Manu and his wife Seini. Droughts in 1997 and 1999 meant that there was very little available from the farmers to export. Fortunately, Seini had set up an irrigation system on their farm and there was just enough income from the irrigated taro and vegetables to survive the drought years. Manu and Seini have diversified over the years. They still buy, process and export root crops. They also grow taro for export and vegetables for the local market. In addition, Manu and Seini have also expanded into vanilla farming and exporting. They now have 20 permanent workers and are optimistic about their future.

Conclusion

Once again, Manu and Seini are not real people. However, they are true-to-life examples of successful commercial root crop exporters in Tonga. There are many reasons for their success. Manu and Seini are examples of successful root crop exporters because they are honest, hard-working, perseverant, clever, fluent in English, innovative and flexible. In addition, they are also committed to their work. They overcome obstacles of supply and processing as the obstacles arise. They do not stop their exporting work for funerals, weddings, birthdays or other family or social functions. Instead, they plan and organise exporting work so that it continues despite family, social, and other interruptions.

As a result, importers choose to deal with exporters like Manu and Seini because they can be are relied on to deliver the goods. For the importer, the most important thing about an exporter is reliability. The importer has to supply his customers. If the importer cannot supply, he loses customers and business.

While the importer also needs quality products and reasonable prices, these are secondary considerations. The first consideration is whether the exporter can be relied on to deliver. Exporters like Manu and Seini can be relied on to deliver. That is why importers choose to deal with exporters like Manu and Seini. That is why exporters like Manu and Seini succeed in the exporting business.

Kumala (Sweet Potato)

By
Pousima Afeaki, Tinopai Farm, Tonga

Summary

Kumala or sweet potato is widely grown throughout the PICs and is also a well-known staple in Australia and New Zealand. It is drought resistant, has a short growing cycle and can be grown year round. However, it does not store well and has a weevil problem. Therefore it cannot be exported fresh. The Tinopai farm, a commercial farm in Tonga, is currently exploring the potential for producing frozen kumala chips both for the domestic and the export market. It is a useful case study in illustrating the different issues that need to be taken into account in determining whether such a product can potentially be financially viable. Investigations have been ongoing since 1998. Production trials on the farm have identified two varieties that are high yielding and are resistant to diseases and insects. Market research has indicated that hotels in Tonga are interested in experimenting with such chips as a substitute for expensive imported potato chips. Also market research in New Zealand has indicated that the domestic kumala supply is limited implying that there could be a large potential market for imported frozen chips. The Tinopai farm is now working to set up a processing factory, with the help of advice from FAO, that can produce the kumala chips. The plan is to first supply the domestic market and then later the export market. The plans are to enter into contract growing arrangements with small farmers to supply kumala for the factory. This is a nice illustration of how a larger commercial farm with entrepreneurial leadership can provide cash income earning opportunities for smaller farmers. The case study also illustrates four important potential benefits as far as Tonga is concerned, namely: improving food security – in reducing wastage of surplus kumala; creating import substitution possibilities therefore saving foreign exchange; creating export opportunities through overcoming quarantine barriers; and creating income/employment opportunities.

Introduction

Kumala (sweet potato) is a well-known and popular staple food in the Pacific. Kumala is grown throughout the Pacific Islands. Kumala farming was widespread in the Pacific when the first European explorers visited which confirms that contact had been made between the peoples of the Pacific Islands and South America where kumala-farming began.

Kumala is a major root crop and staple food in Tonga. It is grown on all four of the island groups of Tonga. At least 12 different varieties of kumala are grown in Tonga. Kumala is a drought-resistant crop (unlike taro) and can be grown all-year round in Tonga. Planting material is readily available and can be multiplied very easily and quickly. Kumala in Tonga is grown from kumala stems or stalks which are plucked from a growing crop and then planted directly into soil to start a new crop.

Normal kumala yields in Tonga range between 3 and 6 tonnes per acre. Australian trials have resulted in yields of up to 15 tonnes per acre. Tinopai Farm, a farming and exporting business in Tonga has been working on a kumala project since 1998. Tinopai has achieved yields of 7 tonnes per acre and is targeting 10 tonnes per acre.

Kumala is also a well-known staple in New Zealand and Australia. In New Zealand, the Maori grew kumala prior to European contact. Kumala has continued to be a popular alternative staple food for both Maori and non-Maori New Zealanders. Kumala is not as easy to grow in New Zealand as potatoes are, so kumala is not available in large quantities and is much more expensive than potatoes. Australian kumala is grown commercially in Queensland and then transported long distances interstate. Those long-distance transport costs make kumala more expensive than potatoes in Australia.

Tonga does not export any kumala at present. Tonga cannot export fresh kumala to New Zealand or Australia because of a weevil that burrows into kumala tubers in Tonga. However, kumala from Tonga can be exported frozen to New Zealand. Tinopai Farm is working to develop exports of frozen kumala from Tonga to New Zealand.

Background

In 1998, Tinopai Farm started work on a kumala project in Tonga. The aim of the project was to grow and process kumala into frozen chips (french fries) to supply the local Tongan market and also to export to New Zealand.

Tinopai Farm began with farming trials of kumala to select high-yielding varieties with insect and disease resistance. Farming trials have been carried out for 5 years and have identified 2 high-yield varieties of kumala with strong resistance to insects and disease. Future kumala farm trials will focus on irrigation and increased usage of machines (tractors and rotary hoes).

Over the same period, Tinopai also carried out market research in Tonga and New Zealand to determine potential demand for frozen kumala chips. The research indicates initial market demand for frozen chips in Tonga at between 6-8 tonnes per month (72-96 tonnes per annum). Initial market demand in New Zealand is estimated at 400 tonnes per month (4800 tonnes per annum).

Farming Trials

Tinopai began farm trials in 1998 by planting seven different varieties of kumala. For the initial trial, two crops were grown consequetively of the seven varieties, to see which performed best. Performance was rated by overall tuber yield together with disease and pest resistance particularly through the hot, wet season. Of the seven varieties, three were selected as the best performers (Tongan names, Papua, Setaita Molemole and Setaita Petepete).

In 1999 and 2000, trials continued with the three best-performing varieties. Those trials focused on soil preparation techniques, planting densities and weed-control, with planting, weeding and harvesting carried out by hand. Average yields achieved were 5 tonnes per acre. In 2001, one kumala variety (Setaita Petepete) was dropped from the trial because of too many eyes in the skin of the tubers. The eyes were unsightly and required excessive peeling. Since then, trials have been continued with the Setaita Molemole and Papua varieties. Setaita Molemole has tubers with yellow flesh which is moist when cooked. The Papua variety has red/gray flesh which is drier when cooked.

Kumala trials in 2002 focussed on irrigation, increased use of tractor-machine farming, and experiments with insecticides to control leaf and tuber-eating insects. Average yield lifted from 5 to 7 tonnes per acre. Future trials will concentrate on fine-tuning the use of machines and irrigation. Future trials will also include fertigation (fertilizing through irrigation tapes). Tinopai expects to increase kumala yields to 10 tonnes per acre.

Market Research

In Tonga, kumala has not yet been processed commercially in frozen form. Kumala is sold only as fresh tubers. Small quantities of frozen peeled taro and cassava are available for sale on an irregular basis in shops in Tonga. Tonga currently imports about 20 tonnes of frozen potato chips each month for consumption by Tongans and tourists. The imported

frozen potato chips are expensive with retail prices reaching TOP6.00 (USD2.85) per kilogram.

Tinopai has approached local Tongan food-retailers, hotels and resorts, restaurants and fast-food operators to discuss the supply of frozen kumala chips for the customers. The responses have all been enthusiastic. The businesses approached were very keen to be able to offer customers a locally-produced alternative to frozen imported potato chips Tinopai estimates there is an initial demand in Tonga for frozen kumala chips of between 1.5 and 2 tonnes per week (6 to 8 tonnes per month).

Tinopai has also carried out research on the New Zealand kumala market. About 20,000 tonnes of kumala is grown and eaten fresh each year in New Zealand. This kumala is all grown in New Zealand. No fresh kumala is imported into New Zealand due to Quarantine restrictions to protect New Zealand kumala from imported insect pests. Tonga is allowed to export frozen kumala to New Zealand.

Prices for fresh kumala are expensive in New Zealand because kumala can only be grown during the summer and only in limited areas of the North Island. Retail prices for fresh kumala reach NZD6.00 (USD3.70) per kg. Because of the limited kumala supply and high prices, most New Zealand kumala is sold in fresh form. There is very little kumala left available in New Zealand for frozen processing. Suppliers of frozen kumala chips in New Zealand are unable to supply the demand for chips because they cannot get enough kumala from farmers to process.

Tinopai's market research indicates there is an initial market demand for frozen kumala chips in New Zealand of 400 tonnes per month (4,800 tonnes per year). This is on top of the demand for fresh kumala in New Zealand. The opportunity for Tongan kumala in New Zealand is for frozen kumala only. Tonga is not allowed to export fresh kumala to New Zealand. New Zealand farmers would continue to supply the fresh kumala market while Tongan imports would supply the frozen chip market that New Zealand does not supply.

Processing Facility

Tinopai is now working to set up a processing facility to make and supply frozen kumala chips for the local Tongan market. The processing facility planned is a small one which can process up to two tonnes of kumala per week for the local market. The process of turning fresh

tubers into frozen chips will involve peeling and washing, chopping, blanching, frying, packing, freezing and storing. Tinopai is requesting assistance from FAO to identify the appropriate small-scale processing equipment, and assistance to install the equipment and to train workers to operate it.

Tinopai will begin by processing kumala for the local Tongan market. This will provide experience to develop expertise in frozen kumala processing. In time, Tinopai will be able to use this expertise to look at export opportunities to New Zealand as well as to other Pacific Islands.

Why is it Important to Process?

There are many reasons for processing produce. Four good reasons for processing produce are: increasing food security; creating import-substitution opportunities; creating export opportunities/overcoming quarantine barriers; and creating employment opportunities. All four of these reasons apply to the kumala-processing project that Tinopai is working on. Each of the four reasons is listed and evaluated below

1) Increasing Food Security

In Tonga, kumala is eaten fresh as crops mature. Kumala is not processed so that it can be stored and eaten later. When too much kumala is available, farmers are unable to sell their crops and kumala is left to rot in the ground. This is a waste of good food. Processing of kumala into frozen chips will help to reduce the amount of wasted kumala in times of surplus. As stocks of frozen kumala chips build up, these stocks will increase food security by boosting the amount of food reserves available for times of food shortage and emergency.

2) Creating Import-Substitution Opportunities

Tonga like the other Pacific Island nations, imports relatively large quantities of frozen potato chips to supply consumer demand for convenience/fast food from local people and tourists. There is no commercial processing and supply in Tonga of any type of frozen chips. A supply of frozen kumala chips will provide consumers in Tonga with a choice of chips (apart from potato) to eat with their meals. Consumption of locally-made kumala chips will reduce the need to import potato chips. Kumala-chip processing in Tonga will create an opportunity to substitute local kumala for imported potato chips.

3) Creating Export Opportunities/Overcoming Quarantine Barriers

Kumala is a popular staple food throughout the Pacific. It is well-known in Australia and New Zealand from where many Pacific Island tourists come. Kumala/sweet potato is also a well-known staple in Asia and USA from where increasing numbers of tourists are coming to visit the Pacific. Because kumala is such a widely-known food, it is easier to offer kumala to tourists to the Pacific as an alternative to potato chips than for instance, taro or cassava. Tinopai has identified New Zealand as an export-market opportunity for frozen kumala chips. There are also opportunities to export kumala chips to other Pacific Island countries to satisfy local and tourist appetites.

New Zealand Quarantine regulations prohibit the import of fresh kumala from Tonga because of a weevil pest. However, kumala processed into frozen chips can be imported into New Zealand. The Quarantine barrier for Tongan kumala is overcome by processing which eliminates the weevil pest. Tongan kumala will be exported to New Zealand for the first time by Tinopai because it has been processed into frozen chip form.

4) Creating Employment Opportunities

Kumala-chip processing will create two types of work opportunities, direct and indirect. The direct work opportunities will be jobs for workers in the processing facility. Those jobs will come from the processing functions of peeling, washing, chopping, blanching, frying, packing, freezing, storing, and delivering kumala chips. Tinopai estimates that a small-scale facility (up to 2 tonnes per week) will need at least 7 fulltime workers.

The indirect work opportunities will be for farmers to contract-grow kumala (at set prices) to supply the processing facility. Farmers will be organised to grow kumala so that supply is available every week throughout the year. Tinopai considers that 4 contract farmers will be needed, to begin with, to grow kumala to supply the two tonnes needed each week for processing. As production increases, more contract-farmers will be needed to grow more kumala for processing.

Conclusion

The aim of Tinopai's kumala processing project is to turn fresh, perishable kumala into a frozen product which can be stored for local sales in Tonga and for export. Processing will add value to fresh, perishable kumala by turning it into frozen chips with longer storage life and a much higher resale value than fresh kumala. The added-value will pay for processing jobs and for contract kumala-farmers.

The processing/added-value idea is not a new one. What is new in this case is the application of the processing idea to kumala in Tonga. Kumala has not been processed before on a commercial basis in Tonga. Tinopai's market research indicates that there is a local demand for kumala chips in Tonga, and that there are also export opportunities.

With help from FAO, Tinopai will be able to take the next step and begin processing kumala. Tinopai aims to begin processing kumala by the end of 2004. If this happens according to plan, Tinopai intends to be exporting frozen kumala chips to New Zealand and to other Pacific Island countries by 2006. Tinopai believes there is potential for development of a frozen kumala-chip industry in Tonga, in addition to the existing export-industries of squash, vanilla, root-crops, and coffee.

From a wider social and economic perspective, small Pacific Island nations like Tonga must increase processing of their existing export-products. In general, most of the Pacific Island nations continue to export their agricultural products in unprocessed or at best, semi-processed form. Examples include exports of root-crops, copra, dried vanilla beans and kava powder from the Pacific Islands.

These products continue to be exported in raw or semi-processed form. The extra value from further processing into finished products such as frozen chips (for root-crops), soaps and skin-moisturising lotion (from coconut oil), vanilla essence, and kava pills, is lost from the Pacific Islands. It is now feasible to set up small-scale processing facilities in the Pacific Islands, to turn out finished products that match international standards. Tinopai intends to do this with frozen kumala chips. The opportunity is there for other Pacific Islanders to process our 'raw-materials' into finished products.

Kava

By
Pousima Afeaki, Tinopai Farm, Tonga

Summary

Kava, traditionally revered in many of the PICs, has recently become controversial in many high income countries, particularly in Europe. Unlike squash, root crops, and kumala that are widely known outside the PICs there was little understanding how kava should be used. This contributed to the negative reports that are fortunately, currently on the decline. However, this has adversely affected the development of the kava export sector. Kava is not drought resistant but is widely grown throughout Tonga, takes time to mature (i.e., at least two years), and requires some skill and care. Although there are sometimes disease problems, these are somewhat selective and not usually devastating. There is a strong domestic market and prices have stayed firm in spite of price fluctuations in the international market. There is, unlike squash, little government interference in the kava sector (i.e., apart from the need of those who process, trade and export kava to get trading licenses) and there are no quarantine problems with respect to exporting. The private sector in processing kava into powder form is competitive and exporting is easy since it is low volume and high value and is therefore usually air freighted. Few imported inputs are required for kava, meaning that up to 90% of the gross revenue from kava exports is kept in Tonga, compared to only 33% for squash exports. The Tongan kava industry is well developed, robust and competitive and appears to have a promising future in meeting the needs of Tongans living overseas and, in the light of its slow rehabilitation, as a legitimate natural herbal remedy for stress-relief. However, there is a useful lesson with respect to kava. For products not well-known outside the PICs it is important that when they are exported they should be accompanied by an educational programme on their proper use, to prevent possible abuse and ensuing rejection.

Introduction

Kava, the traditional and revered panacea of the Pacific, has recently become controversial in the developed Western world, in particular, in Europe. Kava was taken up by international pharmaceutical firms, processed into concentrated form, and then aggressively marketed as a stress-relieving medicine. It is no surprise that there were reports of adverse side-effects, whether justified or not, from using kava in a concentrated form.

There is no controversy about kava in the Pacific. The peoples of the Pacific Islands have used kava for thousands of years in diluted form, never as a concentrate. We respect that kava is a special plant with therapeutic and medicinal properties that was gifted to the peoples of the Pacific. We know that kava was given to be used carefully.

In Tonga, Fiji, Vanuatu, Rotuma, Wallis, Futuna, Samoa, Hawaii, Kosrae and other islands in the Pacific, as well as in New Zealand, Australia and the USA, Pacific Islanders continue to use kava in their traditional Pacific ways. When kava is used properly, it is a wonderful therapeutic for stress-relief as well as being a powerful medicine for a range of sicknesses and ailments. According to pharmacists, kava is not a 'drug' because use of kava does not lead to addiction or dependency.

Although international demand has decreased dramatically since 2001, leading to major cutbacks in kava production, farmers in the Pacific Islands continue to grow kava to supply local and international demand, especially demand from Pacific Islanders living overseas. After processing into powder, kava is a high-value, low volume product which is easily stored and transported without Quarantine problems. Kava, from the pristine islands of the Pacific, continues to have a huge potential international market. But, people from outside the Pacific need to be shown how to use kava carefully.

Kava is grown on all of the four island groups of Tonga. It grows best where there is regular and plentiful rainfall. The most suitable places to grow kava in Tonga are on 'Eua (near the main island of Tongatapu), Vava'u, Ha'apai on the volcano islands of Kao and Tofua, and in the Niua's, which are all outside the main island of Tongatapu. The outer islands are where most Tongan kava is grown. This means that kava production and processing in Tonga is spread throughout all the island groups of Tonga. The kava industry is not restricted to the large islands of Tongatapu, 'Eua and Vava'u like the squash industry.

Tonga has continued to export kava despite the since the international kava controversy began in 2001. Tonga exported 109 tonnes of powdered kava in 2003, down from 519 tonnes in 2002, reflecting the drop in international demand.[4] Tongan farmers have reduced their kava plantings since 2001 so that supply has also decreased. Kava export prices have dropped but local retail prices have held firm at TOP18-20 (USD8.60-9.50) per kilo of powdered kava. No figures are available for local Tongan

[4] Tonga MAF Quarantine Annual Reports

consumption of kava, but estimates vary from 30 to 60 tonnes per year. Kava-drinking is a popular pastime in Tonga.

Background

Kava (*piper methysticum* or 'intoxicating pepper') is unique as a plant to the Pacific Islands. Research continues but there is general consensus among botanists that kava in its wild form (*piper wichmannii* C. DC) originated from within the area of Papua New Guinea and Irian Jaya, Solomon Islands and Vanuatu. From there, kava was taken, grown and consumed in almost all of the Pacific Islands, including Fiji, Tonga, Samoa, Niue, Hawaii, Marquesas, Tahiti, Cook Islands, Rotuma, Wallis, Futuna, and Kosrae and Pohnpei in the Federated States of Micronesia.[5]

Because kava is such an important plant in the Pacific, most of the Pacific Islands have developed their own legends of how kava originated. The legends all involve supernatural elements about how kava first appeared. The legends vary but many involve sacrifice, death and rebirth in the form of kava. These elements give some indication of the high regard that kava is accorded in the Pacific.

Tonga has its own legend which says that kava grew from the grave of a girl who had been sacrificed by her parents to provide food for a high-chief visiting their island. The parents were poor and had no pigs to cook. When Loau the high-chief, learnt of the sacrifice, he ordered that the girl's body be buried and prophesied that two very special plants would grow from her grave. When the two plants grew, one was kava and the other, sugarcane. Kava and sugarcane are used to this day in the royal 'taumafa kava', the kava-drinking ceremony of the Tu'i Tonga. After drinking kava, sugarcane is chewed as a sorbet to refresh the mouth.

Previously in Tonga, kava-drinking was restricted to the aristocracy and royal family who had leisure time for kava and entertainment in the evenings. Over time, kava-drinking has become widespread and very popular in Tonga, especially in kava clubs. Groups of kava-drinkers have set up kava clubs and clubhouses where club members go to drink kava, talk and sing in the evening. Almost all villages in Tonga, except very small villages, have their own kava club (or multiple clubs in bigger villages) for kava-drinking. In the small villages, kava-drinking is carried out as it was traditionally, in the home when people gather in the evening for recreation.

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[5] Lebot V., 1990. Kava (Piper Methysticum Forst f): The Polynesian Dispersal of an Oceanic Plant.

The Kava Industry in Tonga

Unlike other agricultural industries in Tonga such as the squash and vanilla industries, the kava industry is spread through all four of the island groups in Tonga. The industry supplies steady local demand for kava in Tonga and international demand from Tongans living overseas. This means that the Tongan kava industry is not as dependent on export-earnings as the kava industries in other Pacific Islands nations such as Samoa and Vanuatu.

Over the five-year period between 1999 and 2003, kava-powder exports from Tonga grew steadily from 74 tonnes in 1999 to 97 tonnes in 2001, before exploding to 519 tonnes in 2002, and then contracting to 109 tonnes in 2003 (a total of 855 tonnes over the five year period). [Source: Tonga MAF Quarantine Annual Reports] The resilience of the Tongan kava industry is demonstrated by the fact that Tonga has continued to export large amounts of kava despite the contraction in international demand since the beginning of 2002.

There are no figures available to calculate the actual value of kava exports from Tonga. However, if a net export value of TOP40.00 (USD19.00) per kg is allocated for the value of exported kava (twice the local retail value of TOP20.00 per kg in Tonga), then the total value of exported kava from Tonga between the five years of 1999 and 2003 can be estimated at TOP34.2 million (USD16.2 million) (855 tonnes at TOP40.00 per kg).

This estimate of export-earnings from kava indicates that kava exports have generated similar net earnings over the five years between 1999 and 2003, to those earned by Tonga's premier export industry, squash. While the squash industry has generated higher gross earnings, almost two-thirds of those earnings, on average, are remitted overseas to pay for the costs of seeds, chemicals, fertiliser, packaging and freight. Only one-third of the gross earnings from squash stays in Tonga.

In contrast, the kava industry does not need to pay for as many inputs from outside Tonga to export kava. Costs of exported kava involve pounding machines, packaging (plastic bags and sacks) and freight. There is no need to send money overseas to buy seeds, chemicals and fertiliser. This means a far higher proportion, up to 90%, of the gross revenue earned from kava exports is kept in Tonga, compared to only 33% for squash exports.

Tonga's kava industry is well established. Small-holder and commercial farmers grow kava throughout Tonga. Kava can be sold freshly harvested

(green), or as dried pieces, by farmers to processors who then process kava into powder. The processors then package and sell kava powder locally in Tonga and export it. Within the industry there are kava businesses that are fully vertically-integrated: they grow their own kava, process it into powder, and then sell their kava locally and export it; they also buy kava from other farmers for processing.

During the boom years before 2002, Fijian kava traders travelled to Tonga to buy kava which was air-freighted to Fiji, often for re-export from Fiji. There was strong competition between Tongan processors and also from Fijian traders, to buy kava from farmers.

There has been very little involvement by the Tongan Government in the kava industry. The industry has developed over the past 20 years through private sector initiative. As demand and prices for kava increased over time, farmers and processors responded by increasing plantings and processing capacity. Kava farmers cultivated their own seedlings. In 2000 and 2001, in response to requests from farmers for extra planting material, Tonga MAF nurseries increased production of kava seedlings. Otherwise, the industry has developed without needing or receiving assistance from the Government.

A distinguishing feature of the Tongan kava industry is the national and international 'institution' of kava clubs. Kava clubs in Tonga not only have club-houses but also have their own trucks for members to travel to visit other clubs. Tongans overseas have set up their own kava clubs. Some Tongan clubs have developed branches overseas in New Zealand, Australia, Hawaii, and mainland USA, as members have emigrated from Tonga. Kava clubs actively raise money for community purposes such as village water-supply, street-lighting, and educational scholarships.

Kava clubs have similarities to 'local pubs' in the UK and Europe where local people gather for recreation. However, physical aggression is unknown in kava drinkers due to the narcotic effect of kava.

Kava is also consumed and presented at Tongan social and cultural occasions including funerals, weddings, birthdays, graduations, and at the end of church services. Tongan kava has strong and steady demand because of Tongan cultural practices and also from the institution of kava clubs throughout Tonga and overseas. Every day and night of the week, thousands of Tongans drink kava in Tonga and abroad. Tongans prefer the taste of kava that is grown in Tonga. This preference has helped the development of the industry in Tonga and mitigated the effects of the decrease in international demand since 2002.

Farmer Experiences

Kava in Tonga is grown by a mix of small-holder and commercial farmers. Small-holders typically grow up to a few hundred kava plants on part of their standard 8-acre farms, as well as growing other food and cash crops. Commercial farmers who specialise in kava grow thousands of kava plants on their own farms as well as on other farms they lease. Kava farming is spread throughout Tonga but is concentrated outside the main island Tongatapu, on the outer islands of 'Eua, Vava'u, Kao and Tofua in Ha'apai, and in the northern Niua's, where rainfall is higher and more regular.

Kava is not an easy crop to grow. It is tricky to propagate. Kava does not have seeds or suckers to plant. Instead, the stalks of kava are cut up and planted into soil where they sprout. Once cut, the stalks are prone to bacterial and fungal infections which cause the planted pieces of stalk to rot. Experienced kava farmers have their own methods of cutting stalks and planting to reduce rotting. Inexperienced farmers often find most of their planted stalks have rotted away in the ground.

Once sprouted, it takes at least 2 years of growing before the kava-lactones in a kava plant (which give kava its therapeutic and medicinal qualities) reach the required levels for satisfactory consumption. Traditionally in Tonga, kava was not harvested until it was at least 3 years old to let the plant get bigger and develop more 'taste'. During the 2 to 3 year growing period, the plants must be weeded regularly (monthly) and also regularly mounded up with soil at the base of the stalks to increase root growth. Kava-lactones are contained in both roots and stalks of kava but have higher concentrations in the roots. Kava roots have higher sale value than stalks.

Kava in Tonga is susceptible to diseases including yellow-mosaic leaf virus and kava 'dieback' which causes leaves and stalks to wither and die. There are no treatments available for these diseases. Fortunately for Tongan farmers, the diseases are selective within kava crops and only infect parts of crops, not entire crops.

Kava is not a drought-resistant plant and is very sensitive to lack of water. Inadequate rainfall (at least one inch each month) causes kava to wilt and stop growing, and increases the likelihood of diseases infecting the weakened plants. Kava does not grow well when watered with artesian water containing mineral salts. Hence, most Tongan kava is grown outside Tongatapu which is drought-prone, on islands that have more regular rainfall.

When kava has reached harvest stage, the farmer digs up the whole plant taking care to dig up all the larger roots which can be processed. The stalks of the kava plant are then cut off and are then cut up for replanting, or peeled and cut up if they are to be dried for processing into powder. The dirt on the roots is washed off so the roots can be separated and cut up for drying and processing. The peeled, chopped stalks and roots are then dried in the sun, frequently on roofs of houses. Once dried, the stalks and roots are ready for processing into powder.

At this stage, the farmer may sell his dried kava to a kava trader, or arrange for it to be pounded into powder by a processor. The farmer can then sell his powdered kava to a local trader, or sell directly into the local market, or export overseas to an importer or family. Throughout all the island groups, there are processors and traders who can process and/or buy kava. Because kava farmers have a range of choices, they are able to pick the options which maximise their income from kava. This is a very positive aspect of the Tongan kava industry - farmers have choices because there is an unregulated and competitive market.

Processor/Trader/Exporter Experiences

There are many people and businesses in Tonga who process, trade and export kava. Kava traders need a standard business trading licence from the Ministry of Labour, Commerce & Industries. Apart from the licensing requirement, the Tongan Government does not impose controls on kava traders or restrict the number of traders. The secondary processing/trading level of the kava industry is competitive.

Many of the traders involved in the secondary level are also kava farmers to ensure their own supplies of kava. The traders also buy kava from farmers to fill their local and international orders. In addition, traders process kava into powder for farmers, for a fee. Kava-pounding machines have been installed throughout Tonga by traders, farmers and kava clubs. Kava is pounded into powder in all four of the island groups of Tonga.

After kava has been powdered, it is packed by traders into plastic bags for local sale and export. The standard retail sizes are 120 grams and 1 kg. The 120gram bag is enough to make one kumete (bowl) of kava for drinking. The weights of exported kava varies with importer requirements. Kava exports to Tongans overseas are usually sent in 1 kg bags packed in sacks or cartons. Kava exported to pharmaceutical importers is normally packed in sacks weighing between 20 and 30 kg. Because kava is a low-volume, high-value product, it is usually exported airfreight.

There are opportunities for further processing by traders for export. One such opportunity is for powdered kava to be put into paper-tissue sachets (like tea-bags), so that consumers can make a 'cup of kava' to drink at their convenience. An important consideration here is that the consumer drinks kava in the diluted form used throughout the Pacific, and is not using kava in a concentrated pill/capsule form. It remains to be seen whether international pharmaceutical and health-product firms will assist Tongan (and other Pacific Island) traders in developing such products.

Effects of the Kava Controversy

The Tongan kava industry has been affected by the international kava controversy. Exports reached 97 tonnes in 2001, spiked to 519 tonnes in 2002 and then plummeted to 109 tonnes in 2003. Tonga has however, continued to export kava despite the controversy, to Tongans living overseas and to importers in countries which did not impose kava bans or health-warnings.

By the end of 2003, following the publication of the Kava Report commissioned by the Pacific Islands Forum Secretariat, and communications based on the Report between the Forum and European authorities, it appeared that there were prospects for positive change by European health authorities. The Welsh Parliament has revoked the ban on kava in Wales. Tongan kava farmers and traders (as well as those from other Pacific Islands) are eagerly awaiting revisions of bans on kava by Germany, Italy and France, which were major importers of kava prior to the bans. In the meantime, Tongan farmers and traders continue to grow, process and export kava.

Conclusion

The Tongan kava industry is well developed, robust and competitive. It has been developed by farmers and traders steadily over the past 20 years without significant Government involvement or assistance. The industry is profitable and has very few in the way of imported inputs. It has earned many tens of millions of Tongan pa'anga in foreign exchange. Those earnings have been spread throughout Tonga to farmers and traders in the large, as well as the small and remote islands.

Despite the international kava controversy and bans, the kava industry in Tonga continues to grow, process and export kava. There is steady demand for Tongan kava in Tonga and from Tongans overseas. Tongan farmers have reduced plantings of kava since 2002, but kava is still

being planted. Tonga therefore, will have supplies of kava available for export when the international controversy is resolved. There are indications already in early 2004 that the controversy will be resolved and that kava bans will be lifted in Europe. The Tongan kava industry (and those of the other Pacific Island nations) will benefit enormously from the revision of the kava bans.

Kava continues to have a huge potential international market as a natural herbal remedy for stress-relief. However, there is a major lesson from the kava controversy for the kava industries in Tonga and the other Pacific Island nations. We in Tonga and the Pacific have learnt that other people from outside the Pacific do not know to use kava carefully. In future, we will need to teach others how to use kava properly. This means that we in the Pacific need to take control of the processing and marketing of kava internationally, so that other people can be shown how to use kava in the beneficial Pacific ways.

Vanilla

By
Pousima Afeaki, Tinopai Farm, Tonga

Summary

Vanilla is the oldest major agricultural export product in Tonga, have started in 1975. The case study largely written in anecdotal form indicates the vanilla industry has suffered at different times from unfavourable weather and price fluctuations in the international market. However, it still remains an important cash crop earner for Tongan farmers. Tongan vanilla now attracts premium prices on the international markets because it is of top quality and is a pure and natural product. No insecticides, pesticides or inorganic fertilisers are used. However, the technology for growing vanilla, which takes five years to mature, is quite complicated and time consuming. Because of the time period required to reach maturity farmers often intercrop taro, vegetables and/or kava between the rows. The technology was initially introduced by and planting materials provided by, the Ministry of Agriculture, Forestry and Food (MAFF). Government is still involved in regulating the export sector with authority to grade, select and approve vanilla that can be exported. They also certify approved farmers who can sell vanilla to export/dealers who are authorised to provide such functions. However, unlike the case of squash, the role of government has not been controversial, and there are enough export dealers to provide healthy competition. There are also a large number of countries in the international market so the dealers can shop around for the best prices. The benefits of the vanilla industry to the Tongan economy have been impressive both in terms of foreign exchange and employment in the production and curing and grading areas. Like kumala and other root crops a very high percentage of the export proceeds from vanilla (i.e., as high as 90%) are available for distribution in Tonga. The future of the vanilla industry in the main island groups of Tonga continues to look promising.

Introduction

Semisi Fualelei smiles at Heilala, his wife as they watch the interisland ferry dock at Halaevalu wharf on Vava'u. The ferry is carrying a new 4wheeldrive truck from the main island of Tongatapu, to replace Semisi's old 2wheeldrive truck. Semisi is looking forward to not getting stuck all the time on the muddy roads in the hills around his farm. Heilala is

looking forward to using the new automatic washing machine that is also coming on the truck. The old manual wringer washing machine has had its day.

Semisi and Heilala paid cash for the new truck and washing machine from the vanilla payment they received last month. This year was a very good one for vanilla farmers with prices reaching a record TOP50.00 (USD23.81) per kilo for A-grade green vanilla beans. Semisi and Heilala managed to harvest and sell 500 kilos of A-grade beans and another 200 kilos of B-grade from their farm. In total, they received TOP32,000 (USD15,238) for their vanilla this season.

Things have not always been so good. Semisi and Heilala have been growing vanilla for nearly 30 years since 1975 when vanilla was introduced to Tonga. In that time, they have suffered many bad seasons with droughts, hurricanes, and low prices. Only five years ago, prices crashed to TOP7.00 (USD3.33) per kilo because of international over-supply. At that time, some vanilla farmers in Vava'u pulled out their vanilla plants and replanted other crops. Those farmers are now regretting their hasty actions.

Semisi and Heilala began their vanilla farming with 200 vanilla plants. They tended those plants for four years before getting their first harvest in the fifth year. For planting material, they set up their own vanilla-nursery. They now have 12,000 vanilla plants growing on their own farm and also on a leased farm-block. The Fualelei's grow other cash crops including kava and hiapo/paper mulberry (for tapa-making), as well as bananas and rootcrops for food.

Vanilla however, is their main cashcrop. Semisi and Heilala have been able to raise and educate their 8 children with vanilla proceeds. Their children are now all grown and married with their own children. Five live overseas in New Zealand and Australia, two live in Tongatapu, and one son and his wife live and work on their own farm in Vava'u.

Twelve years ago, the family home caught fire and burned down. Semisi and Heilala were able to rebuild their home with money from vanilla and timber milled from their farm. Their children offered to help with money and building supplies. Semisi and Heilala were grateful for the offers but only asked their children to provide money for food for the builders. The family home was rebuilt while vanilla and other farming operations continued.

The Fualelei name is not a real family name. The history however, is of a real Tongan family who grow vanilla in Vava'u. That family is one of many families in Tonga on the islands of Vava'u, 'Eua and Tongatapu, who have been growing vanilla diligently for many years. Over the years, those vanilla farmers have developed a pure and natural product which is internationally recognised. Tongan vanilla is rated top-quality pure and natural on the international market and is sold at premium prices in Europe, Asia and the USA.

Background

The King of Tonga, King Taufa'ahau Tupou IV, instigated vanilla farming in Tonga in the early 1970's. At the King's direction, the Ministry of Agriculture, Forestry and Food (MAFF) began a project to introduce vanilla farming as a cash crop to Tongan farmers. MAFF nurseries raised planting material for farmers, and MAFF technicians advised farmers on tending their vanilla. The project was implemented on all of the four island groups of Tonga.

After 30 years, vanilla is grown throughout Tonga. The major vanilla growing areas are on the islands of Vava'u and 'Eua, and to a lesser extent on Tongatapu. Vanilla has, as the King of Tonga foresaw, become a valuable source of income for Tongan farmers and the Kingdom.

Vanilla *(Vanilla Planifolia*) is a member of the orchid family of plants. Vanilla originates from Mexico but is now grown in many countries including Madagascar, Indonesia, Papua New Guinea, Fiji and Tonga. It grows as a vine which climbs another plant using it for support.

In addition to underground roots, vanilla plants grow aerial roots along the vine which are used to attach the vine to the host plant. Vanilla can grow without rooting in soil. The aerial roots absorb water and nutrients from the air and from plant debris that builds up around the aerial roots. Vanilla is an epiphyte plant which uses its host only for support - vanilla is not a parasite because it does not eat from its host

In Tonga, fiki trees (*Jatropha curcas*) are grown for vanilla vines to climb. Branches of mature fiki trees are cut and planted in the ground to grow for up to a year. Spacing ranges from 1.5-2.7 metres (5-9 feet). Once the fiki trees have established themselves, lengths of vanilla vines are cut off mature vanilla plants for planting material. The vanilla vines are planted at the base of the fiki trees and the vines are wound around and tied on to the fiki trees. As vanilla grows, it puts out aerial roots to cling

to the fiki tree.

Vanilla takes up to 5 years to mature and bear fruit (beans). Time to maturity and fruiting depends on the initial length of the vine that is planted and also on the care of the crop. If the planting material is long, 1.5-1.8 metres (5-6 feet), and weeding is carried out regularly (monthly), and the fiki trees are pruned annually to give the vanilla exposure to sunlight, then maturity and fruit can happen in 3 years.

As the vanilla vines grow, they are wound back down to the ground to establish more ground roots for extra nutrition, and then wound back up the fiki tree. The fiki trees are pruned each year to a height of around 1.5 metres (5 feet) so that the vanilla is not too high for workers to reach.

Because of the time it takes for vanilla to mature, most Tongan farmers intercrop between their vanilla plants. Intercrops include taro (both colocasia esculenta and xanthosoma), kape (alocasia), vegetables and kava. Intercropping allows vanilla farmers to make something from the land while they work on and wait for their vanilla to mature and bear fruit

In addition to weeding, pruning of the fiki trees, and winding of the vanilla vines, in Tonga, vanilla flowers must be pollinated by hand to make sure that beans develop fully. Vanilla has a long narrow flower which cannot be pollinated properly by bees and other insects in Tonga. Pollination is done by hand with tu'aniu (midrib stick from the coconut leaf) used to transfer pollen from the male stamen to the female stigma inside the vanilla flower.

In Tonga, vanilla plants begin flowering in October and continue flowering until March. After pollination, vanilla beans take six months to grow to maturity. Harvesting of the mature green beans begins in April and continues through to August. After harvest, Tongan farmers sell their beans to vanilla dealers who then dry and cure the beans for export.

The Vanilla Industry in Tonga

The vanilla industry in Tonga, like the squash industry, is regulated by the Government. The Ministry of Agriculture, Forestry and Food (MAFF) has wide powers to control the quality of exported vanilla under the Fruit Export (Vanilla) Regulations 1993. Under the Vanilla Regulations, MAFF is given specific powers to grade, select and approve vanilla that can be exported. MAFF is also given powers to register authorised farmers who can sell vanilla to exporter/dealers. In addition, MAFF authorises

vanilla dealers who can export.

Despite these wide-ranging controls, the vanilla industry in Tonga has not been subject to the amount of controversy and conflict that the squash industry has had. Fortunately, vanilla can be sold to many international markets, unlike squash which is only sold to Japan. This means that Tongan vanilla dealers are able to shop around for the best deal available on the international markets, and pay that price to farmers. Farmers are paid in cash when they sell to dealers. The dealers compete with each other on price to buy vanilla. This is good for vanilla farmers.

The harvesting season for vanilla is between April and August. MAFF declares inspection dates and places throughout Tonga where farmers can get their green vanilla beans inspected and certified by MAFF inspectors. Beans are inspected and graded as Grade 1 (excellent-quality), Grade 2 (good quality), and Reject beans.

After inspection and certification, farmers can then sell their certified vanilla to dealers. Dealers pay prices which vary with the certified quality of the beans. During the 2003 season, four authorised dealers competed to buy vanilla from Tongan farmers. By the end of the harvest season in August, prices hit TOP60 (USD28.57) per kilo of Grade 1 green beans. Vanilla farmers in Tonga were very happy with prices paid in 2003.

After buying green vanilla beans, the dealers cure the beans for export. Curing is carried out in two ways. The first is by blanching and then drying beans in sunlight and also in the shade (if it is raining) on drying racks. The second way is to use hot air or an oven to dry and cure the vanilla. Both methods are used in Tonga. During curing time, the delicious and tantalising aroma of vanilla is in the air night and day in the areas around the curing sheds.

After curing, vanilla beans are graded into 5 export grades, Premium (top-quality), Grade 1 (excellent quality), Grade 2 (good quality), Industrial (a mix of Grades 1 and 2), and Special (beans which have been cut and are not whole). Before export, cured beans are inspected and certified by MAFF Quarantine inspectors. After inspection, Tongan vanilla is exported by dealers as a top-quality, pure and natural product to the USA, Europe and Asia.

Over the 13 years between 1991 and 2003, Tonga exported a total of 380 tonnes of cured vanilla, with an average of 29.2 tonnes of vanilla each year. Annual exports have fluctuated greatly with the effects of

international oversupply, droughts and hurricanes. Peak export years occurred in 1991 (69.9 tonnes), 1995 (53.1 tonnes) and 1999 (56.2 tonnes). Very low export years were in 1997 (11.1 tonnes), 2001 (4.7 tonnes) and 2002 (7.8 tonnes). [Source: Tonga MAFF Quarantine Division Annual Reports]

No figures are publicly available for the value of vanilla exports from Tonga. However, estimates can be made of the gross value of vanilla payments made to Tongan farmers and the gross value of exported vanilla.

The average ratio of green to cured beans is 4:1, ie, it takes four kg of green beans to get one kg of cured beans. In 2003, Tonga exported 16.1 tonnes of cured beans. This means about 64 tonnes of green beans were bought from farmers (16.1 tonnes multiplied by 4). Assuming an average price of TOP40 (USD19.04) per kg for green beans, then the value of green beans bought from Tongan farmers in 2003 can be calculated at TOP2,546,000 (USD1,266,666) (64 tonnes at TOP40 per kg).

The international price for top-quality cured vanilla in 2003 was stable at around USD400 (TOP840) per kg. Tonga exported 16.1 tonnes of cured vanilla in 2003. Assuming an average price of USD250 per kg for those exports, then Tongan vanilla exporters earned gross revenue of around USD4,025,000 (TOP8,452,500) in 2003 (16.1 tonnes at USD250 per kg).

In sum, assuming an average price paid to farmers of TOP40 per kg for green beans, then Tongan farmers earned TOP2,546,000 (USD1,266,666) from their vanilla in 2003. Vanilla dealers, assuming an average price of USD250 per kg of cured beans, earned gross export revenue of TOP8,452,500 (USD4,025,000) from vanilla exports. Tongan farmers made good money from vanilla in 2003. Dealers made very good money from vanilla exporting in 2003.

Vanilla, like kava and root-crops, does not need many inputs from outside Tonga. The only external inputs needed for vanilla in Tonga are packaging and international freight. The cost of those two inputs is relatively low because cured dry vanilla is compact to pack and freight. Only 10% at the most of the gross export revenue from vanilla is needed to pay for packaging and freight. This leaves 90% of the export proceeds from vanilla available for distribution in Tonga.

In contrast, only 30-35% of the gross export proceeds from squash

exports are available for distribution in Tonga – the rest is remitted overseas to pay for external input costs of seeds, NPK fertiliser, fungicides and pesticides, packaging and freight. Unlike squash, vanilla planting material is available from within Tonga. No insecticides, pesticides or inorganic NPK fertilisers are used on vanilla. Packaging (cardboard cartons and plastic bags) are imported to pack export vanilla, but in relatively small volumes because cured vanilla does not take up much space. International freight costs are therefore also not expensive relative to the value of exported vanilla.

Future Prospects

International prices for vanilla crashed in the late 1990's due to over-supply. Prices have since recovered and reached new record highs in 2003 due in part to poor harvests in vanilla-producing countries, and also to the increase in demand for vanilla following the decision by Coca Cola to introduce their new 'Vanilla Coke' soft-drink.

Tongan farmers have responded by planting more vanilla. More vanilla has been planted in the islands of Vava'u, 'Eua, and Tongatapu where vanilla is already well-established. In addition, a vanilla-planting programme was instituted for farmers in the Ha'apai island group in 2002 and 2003 to increase cash crop opportunities for those farmers. It will take up to 5 years for those newly-planted crops to mature and bear fruit, but when they do, Tonga's vanilla-exporting capacity will increase.

Prices will continue to fluctuate but with the increased plantings, Tonga will be better placed to take advantage of the 'good price' years.

Conclusion

Tonga has been growing and exporting vanilla for thirty years since 1975. Over that time, the fortunes of vanilla have waxed and waned with the vagaries of weather and international markets. Despite those vagaries, Tongan farmers have stuck with their vanilla. Tongan vanilla now fetches premium prices on the international markets because it is recognised as a top-quality, pure and natural product.

Vanilla has earned Tonga many many millions of dollars in foreign exchange earnings over its thirty-year history. Vanilla provides employment and income for hundreds of farmers and also for many more farm labourers and processing workers in Tonga each year.

The vanilla industry is regulated by the Tongan Government and thrives.

It is an example of a regulated industry that works. Vanilla can be sold to many countries on the international market. Tongan vanilla dealers shop around to get the best deal to pay to farmers. This means that Tongan farmers get paid competitive prices, in cash, for their vanilla each year. Because of this, hundreds of farmers throughout Tonga continue to grow and tend their vanilla.

Farmers like Semisi Fualelei and his wife Heilala on the island of Vava'u are longtimers at vanilla. They have managed to raise a family and prosper over the years with money from vanilla. They will keep growing vanilla as they have for the past thirty years. So will hundreds of other vanilla farmers in Vava'u, 'Eua and Tongatapu, and now also in Ha'apai. Those farmers believe the prospects for vanilla farming and increased vanilla exports from Tonga are good.

5. Papua New Guinea (PNG)

From Subsistence to Mixed Crop/Livestock Farming

By
Tony Jansen, Kastom Gaden Association, Solomon Islands

Summary

This case study describes the successes and misfortunes of a farmer, Paliawe Kunago, who has six sons and lives in Tari District in the Southern Highlands. Paliawe is a respected church and community leader who became associated with the Family Health and Improvement Programme (FHRIP). This programme helped him and his wife become better informed about household hygiene and causes and treatment of common illnesses. The programme also provided a plastic drum, plastic buckets and supported the construction of a pit latrine and establishment of a nutrition garden. They also helped his farming through loans for improved chicken and newly introduced rabbits. He was so successful that he became a Local Assistant for the FHRIP. As a result he helped to support 19 families in his area and was a role model for many others. He continued the latter even after FHRIP ceased operations. But a tribal fight set the area back and he still has to completely recover from this misfortune. Providing stability can be restored he is hopeful that progress can once again be made through being associated with another programme, the Community Based Health Care (CBHC) programme. The case study illustrates how important leadership is, and how support programmes can help that leadership blossom. It also demonstrates the spirit and resilience of many poor people in the face of adversity.

The Story

The farmer is Paliawe Kunago aged 44, married with six sons aged from 1 to 18 years old. He lives in Waralo which is about 6km west of Tari Town, in Tari District, Southern Highlands. The altitude of the village is about 1680m above sea level. Tari is wet year-round, with an average annual rainfall of about 2700mm spread over more than 300 wet days, with an average minimum temperature of 14C and a maximum of 24C.

People cultivate permanent sweet potato gardens that are fallowed after a number of years of continuous production. Compost is placed in sweet

potato mounds to sustain yields. Pigs are kept on ropes and graze in swamps or in old sweet potato gardens. Pigs are used mainly for exchange rather than consumption. A mixture of crops and fruits are grown in "kitchen" gardens made around houses. Many people have small coffee plots.

Tari has a diverse environment that may be divided into a number of environmental zones based on geology, soil type, altitude and slope. The village of Waralo lies in an area where volcanic ash has covered limestone. The topography consists of sharp ridges, sinkholes and lakes.

Over 50,000 people live in the Tari basin. Land may be acquired from both paternal and maternal forebears. Families live in homesteads scattered across their clan land rather than in nucleated settlements. Houses and gardens are often separated from neighbours by deep drains which delineate ownership and provide privacy.

This case study is about Paliawe Kunago, a Huli farmer living in a rural setting typical of most of his kinsfolk. Paliawe was born at Waralo in the central Tari basin about 1959, a few years after administrative control was established in the district. He completed three years of primary schooling and then spent several years working as a casual labourer on coffee plantations in the Western Highlands Province. When he married in the mid-1980's he moved to his wife's nearby clan land of Tari. Soon afterwards he became involved as a committee member of the local catholic church. His house and gardens are situated on the side of a steep slope, a few minutes walk from the main road linking Tari to the other centres to the west. It takes about 20 minutes by vehicle to reach Tari town. Paliawe can speak Tok Pisin but prefers to speak in Huli, the local language.

Like most of the central Tari basin, Waralo is densely populated. Paliawe and his family live on a staple diet of sweet potatoes which are planted on mounds in gardens spread over several locations, sometimes with sugar cane and edible pitpit (*Setaria palmifolia*) if the soil is fertile enough. Until 1995 Paliawe and his wife, like many small farmers, earned small amounts of money selling local greens, sugar cane and oil pandanus (*pandanus conoideus*) in the market. They also sold some coffee beans from their small coffee plot to roadside vendors. However it was difficult to raise enough money in this manner to meet family needs. Paliawe says his family was often sick. The children were poorly nourished, had protuding stomachs and spindly limbs. His oldest son, Matialu contracted

tuberculosis a year earlier, when he was aged 10, leading to costly visits to seek treatment outside Tari district. The family owned few possessions apart from utensils, tools and bedding, and lived together in a small hut with a central fireplace, grass roof and thatched bamboo walls. There was no clean water supply near the house and no properly constructed toilet.

In 1995 Paliawe joined the Family Health and Rural Improvement Programme (FHRIP), which started a pilot programme in Waralo and two other census units (i.e., administratively defined as groups of clans) in that year. Under the programme, Paliawe planted a nutrition garden, constructed a small rain water catchment using a plastic sheet and built an improved pit latrine. His wife learnt from female FHRIP health workers about the causes of common diseases and their treatment, and how to improve household hygiene and treat children's sores using the small health kit provided. The family also received a 200 litre heavy duty plastic drum with a lid and tap, and three plastic buckets for use in maintaining hygiene around the house.

Like nearly all Huli families, Paliawe and his wife had a small "kitchen" garden surrounding their house in which they grew bananas, pumpkin and a range of vegetables, fruits (e.g., passionfruit and tree tomato) and local greens (i.e., *amaranthus spp*, *oenanthe javanica*, and *rungia klossii*). This plot was enriched with sweet potato peel and other food scraps which raised the level of organic matter and permitted the production of a more diverse range of crops than was possible in other gardens.

For his nutrition garden Paliawe was asked to make a separate plot on which to plant corn and a range of legumes including peanuts, soya beans, runner beans, lablab beans, pigeon peas and lima beans, and to dig a compost hole and fill it with organic matter to help sustain the garden. While most of these crops can be found in the Tari district, few families plant them all or use them as a regular supplement to their or their animals' diet. The Huli have a low intake of proteins and the regular consumption of protein rich plant and animal foods is likely to improve growth and nutrition of children and adults, especially pregnant and nursing women.

Paliawe chose a site on a north-facing sloping for his nutrition garden. The soil was a fairly thin layer of dark brown volcanic ash overlaying an orange clay base, typical of the soil profile of local slopes. The site had

previously been used for sweet potato, and above it was a small coffee plot. The surrounding vegetation consisted of ferns, sword grass (i.e., *imperata*) and cane grass (i.e., *miscanthus*).

Paliawe's nutritional garden flourished. In early 1996, six months after the garden was started, he had expanded his original plots to contain the following crops: winged beans (*psophocarpus tetragonolobus*), lablab beans, corn, common beans, peanuts, tigibi, local cabbage, gereba, ginger, soybeans, cherry tomatoes, pumpkin, aluba, lima beans, aibika (*hibiscus manihot*), leeks, irish potatoes and tobacco. He provided seeds to the FHRIP and received a garden fork in exchange, which was useful for turning compost and breaking up wet soil.

Paliawe was one of the first people to purchase Australorps chickens and wire under Phase 2 of FHRIP. Phase 2 assisted successful families in further improving their livelihoods through the introduction of permanent materials for water catchments, and the introduction of small livestock to improve nutrition and raise some cash. Previously Paliawe had owned only a few chickens, that foraged in the garden and surrounding bush, and laid very few eggs. He built a pen of about 50 square metres and inside made a small hen house. The Australorps were allowed to forage under supervision and were kept away from the nutrition garden. They laid many more eggs than the local chickens, but did not sit on them. After the introduction of some village chickens to the flock, many chicks were successfully hatched. He sold both the eggs and live birds, earning K100 from eggs alone in one year, as well as providing a nutritious supplement for his growing family which by 1999 numbered five sons.

A useful by-product from penning the chickens was the manure from the hen house and the compost formed by the chickens turning over grass and other matter placed in their pen. When applied to the volcanic ash soil, which tends to fix phosphorus, these phosphorus-rich organic additives enabled Paliawe to sustain the yields of nutritional crops and to plant market crops lsuch as cabbages that sold for a good price in local markets.

With FHRIP assistance he built a washroom with an iron roof that provided a permanent water catchment for the family. He also built a larger house and a separate, open hut for cooking. Paliawe says that, as a result of their improved diet and living conditions, the children began to grow better. After completing his course of medicine, Matialu recovered from TB and though FHRIP health workers reported the smaller children

continued to suffer occasional bouts of common illnesses such as cough, fever, shortness of breath, otitis media, diarrhoea and vomiting, the severity and frequency of these episodes diminished as time went on.

Because of the good care Paliawe and his wife took of the farm and household, their farm became a role model and resource base for FHRIP. In 1997 Paliawe was appointed the Local Assistant for FHRIP at Waralo. In this capacity he identified other families interested in joining the programme and encouraged them in their efforts to improve their families' standard of living. Once they joined the programme he assisted them in making household improvements, planting their nutrition gardens and raising livestock. For this he was paid a small part-time income.

When rabbits were introduced by the FHRIP in 1998 Paliawe was one of the first adopters. He made a hut of bush materials with an iron roof. Two three-unit rabbit cages constructed from strong mesh wire were provided by FHRIP. His efforts proved successful, and he soon repaid the programme for the cages plus equipment and became an important provider of stock for families wishing to join the rabbit programme. The rabbits also provided an excellent source of manure and compost for the gardens.

Paliawe also tried his hand at raising a sheep but unfortunately the ewe had birthing difficulties trying to deliver triplets and died along with its lambs.

By early 2000 Paliawe was helping to support 19 local families all of whom had a family water supply, pit latrines and nutrition gardens Several also had acquired either chickens or rabbits. Waralo consistently achieved the best results in terms of family improvement among the twenty census units participating in the FHRIP.

When FHRIP ceased operations as an independent organisation in late 2000, Paliawe was left with little support for his activities. No assistance was available from government agencies. The Department of Agriculture and Livestock maintained an office in Tari but its extension programme had ceased to operate many years earlier.

Despite this he maintained a diverse family farm and remained a role model and source of support for other local families. He continued to make money from chickens, eggs and rabbits, earning several hundred dollars in a year. Rabbit meat is now widely accepted in Tari and live rabbits are worth K25 each. The Australorps chickens he raised were

also in high demand, as there was no longer any source of day-old Australorps chicks in PNG. FHRIP had planned to build a network of "support stations" – namely programme -supported family-run propagation, breeding and workshop sites, located in each local community. Due to its demise few developed although a few families such as Paliawe's maintained their own sites.

Further adversity followed for Paliawe. In 2002 a large scale tribal fight erupted in which his brother was directly involved. He was forced to leave his house and land. His rabbit house was destroyed in a raid by enemy clansmen and sheets of roofing iron were stolen from his washroom. Many of his chickens were taken. He was unable to stay at his home and keeps his rabbits under the raised floor of the house where they are fed by his family members.

Currently Paliawe has only a few chickens, pigs and rabbits. His nutritional garden has become overgrown, although the water supply and house are in good shape. He has some coffee trees but doesn't know how to prune and tend them. The coffee price is highly variable and often very low in Tari due to the effects of distance to the port, poor road maintenance and criminal activity along the road. However he must still earn money to pay school fees for his oldest three sons, and for other necessities for his wife and younger three sons, such as cooking oil, clothes and soap.

Paliawe has inspired others around him, some of whom also raise rabbits, keep chickens and maintain well kept households. His community plans to join the Community Based Health Care (CBHC) programme when the fighting ceases. CBHC helps communities to self-organise, set common development goals, and meet their health needs using their own resources. CBHC took over the management of FHRIP in 2000 and since then FHRIP has operated as an adjunct to the CBHC programme, though it has not yet extended its operations to Waralo.

If his local community join CBHC, Paliawe would like to start a fish pond. CBHC introduced carp to their communities in 2000, with fingerlings sourced from a hatchery at Aiyura in the Eastern Highlands Province. There are now dozens of fish farmers in Tari, some tending hundreds of fish.

In the meantime Paliawe maintains his profile as a respected church and community leader, activities which occupy a considerable amount of his time. The future for Paliawe and farmers like him hangs in the

balance. Unless effective administrative control and government services can be restored in Tari district it will be difficult for even the most diligent and committed farmer to operate in an environment in which law and order has broken down and where there are no extension programmes or workers to help them to achieve their personal goals and help their communities to grow and prosper.

6. Fiji

A Typical Fijian Village Farmer

By
Ilemeleki Kayanuanu, Fiji

Summary

This case study is typical of the situations of many semi-subsistence farming families in the PICs. Viliame who lives in Nakoro village in an isolated part of Yasana Province works hard to produce products for the market. After an expensive boat trip to the market he becomes a price taker when selling his product. He is not very successful. If he knew how much it cost to produce the product then he could adopt more of a marketing mentality and set his selling price, perhaps at a lower level, providing the selling price covered his costs. Keeping simple farm records would allow him to find out his costs of production.

The Story

It was another typical Friday morning in Nakoro village located in Yasana province, when Viliame, a father of three, had to get up early to go to his garden. It is actually the day of the week when most men in the village harvest their produce (*basa*) to take to the market on Saturday.

After family worship and breakfast, he planned the day with his wife and children before leaving for his garden which was quite a distance from the village. Since he has to harvest and cart the produce back to the village, Viliame has to take the family horse with him. This is a typical carting medium for farmers in the highlands in Fiji. It took Viliame 30 minutes on horseback to reach his farm. Viliame like most Fijians cultivates allocated *mataqali* (clan) land which is often far-away from the village. This type of land is owned by the whole clan. Therefore no individual has the right of ownership.

It was around 9 o'clock when he reached his garden. Viliame's farming is typically subsistence using only simple implements such as a digging fork and spade. He does not use fertilizers or chemicals for controlling weeds and pests. He plants root crops such as taro, cassava, yams, chilies and bele (*Abelmoschus manihot (L) Medik*).

As always he takes a walk around his plantation to check for any damage that might be caused by wild pigs or by someone harvesting part of his crop without his knowledge (i.e., stealing!). Then he started weeding and planting to replace what was harvested previously and also planted a new area. This took another hour before he started harvesting for the market apart from what was to be consumed at home. On that day he uprooted 80 taro suckers which he tied into bundles each consisting of eight suckers. This was completed in the 40 minutes before he headed back to the village.

It was around 1 o'clock when Viliame arrived in the village with his horse carrying the produce. After having lunch, he took a nap and then helped his wife with some of the chores at home and prepared for his market day in Navua town the next day.

Around 4 o'clock in the morning the next day (Saturday), Viliame and his wife got up early to prepare for a boat ride down the Navua River to sell their Dalo (Taro) at the Navua market. The Nakoro village in the province of Yasana is situated in an area of rugged terrain that can only be accessed by boat. The boat ride took 40 minutes down the winding Navua river after they left the village at 5 o'clock and it cost them F$12 for return tickets. At the market, not only Viliame was selling Dalo but other farmers and of course the middlemen.

Since arriving at the market in the morning, one bundle of *dalo* (taro) of 8 suckers was selling at F$15. This was the price set by the market and Viliame follow suit. Up until lunch time, from the 10 bundles he wanted to sell he had managed to sell only one. It was rather frustrating as they were thinking of doing their grocery shopping after lunch but they had not got enough money from their sales. During the afternoon after looking at the way consumers were buying *dalo*, Viliame dropped the price to F$10 per bundle and managed to sell two more bundles. However, at the end of that day he had only managed to sell three bundles and got a total return of $35. This was far less then what he was expecting. What was even more frustrating was that they had to go back home with five bundles after giving two bundles free to their relatives staying in Navua town and not being able to complete grocery shopping.

Well it is one thing to know how to grow a crop it is a completely different set of skills in knowing how to market it. Having skills in both growing and marketing becomes important as farmers become more commercialised.

This story illustrates the importance of Viliame knowing how much it cost him to produce the suckers. He could do this by keeping simple farm records of the time and costs of inputs that he used in producing the taro suckers. Some may perceive this as a time wasting activity but if Viliame did this it could help him in making a better decision as to what to sell his taro suckers for in the future and still make a profit. This will help empower him to set his own price rather then being a price taker.

Experiences with the Farm Management Information System

By
Ilemeleki Kayanuanu, Fiji

Summary

Fiji in the 1990's had a computer software package (i.e., the Farm Management Information System (FMIS)) that calculated gross margins for different enterprises once information relating to inputs, production, and associated cost and price per unit data had been entered. Gross margins were calculated for both semi-subsistence and commercial type farms. Such information is very useful to many people in the agricultural sector but especially for commercial farmers and for agricultural extension officers giving advice to all types of farmers. It can be very useful to see how results on specific farms compare with average results and such information can also help in planning what to do. However, this potentially valuable programme no longer exists eliminating the possibility of using a useful advisory, analytical and planning tool. Reasons for the demise of FMIS are described. Unfortunately, apart from Tonga, the current lack of such information is the case in virtually all of the PICs. This is tragic as such information will become even more valuable as agriculture in the PICs becomes increasingly commercialised.

Background

Towards the end of the 1980's, the idea was promoted of Fiji's Farm Management Unit having the Farm Management Information System (FMIS). This was encouraged in conjunction with on-going assistance provided to the Ministry on Farm Management by Lincoln University in New Zealand.

In the early 1990's, with the help of external funding, a technical consultant was engaged to install the FMIS computer package with the intention that it would provide a "database" of farm management information. Another project also implemented at the same time resulted in the production of the Fiji Farm Management Manual.

Reasons for the FMIS Package

When executing their daily activities agricultural extension officers often had to use outdated information in the Farm Management Manual. The financial information in particular and to a lesser extent technical data became outdated quite quickly thus reducing their usefulness. A package was needed that could regularly update this information so that it was more relevant to the current situation. Because of limited Ministry resources, it was considered better to update the information as and when necessary rather than do a complete overhaul of the whole Farm Management Manual. This was the reason why the FMIS package was developed so that sections that changed frequently could easily be updated.

The FMIS Package

The FMIS, which was a computer package installed in the Farm Management Unit at the Ministry's Head Office, was divided into two major sections compatible with how "commodity gross margins" are worked out. It was formulated in such a way that changes in input and output prices and expected seasonal yields of any commodity (i.e., crop or livestock) could be entered and then the computer automatically calculated the gross margin. Also, the package differentiated according to whether the farms were semi-commercial or commercial and if labour was "costed" or "not costed". The intention was that output from the FMIS would continuously update the Farm Management Manual which in turn would allow staff in the Ministry to be more efficient and current in the information they provided and advice they gave. Together, the manual and the FMIS would serve as a guide for all associated with agriculture, but would also enable them to keep up with changing times.

The FMIS Now

Sadly this package no longer exists in Fiji's Farm Management Unit. The following reasons appear to have caused its demise:

- Probably most important was that as a computer package, it became outdated because it was based on Lotus 123 software and was never updated for use in a windows based spreadsheet programme.
- Changes occurred in the Ministry's policy concerning farm management activities. During the 1980's and early 1990's, the Farm Management Unit was seen to be providing an advisory role to

management on economic issues relating to agricultural development. Then with the formation of the Economic Planning Division, the unit became weaker and in the late 1990's moved to the Extension Division and then even more recently to the Land Resettlement Division.

- Two of the staff that were trained to use the FMIS resigned thereby inhibiting the continuity and sustainability of the programme. Also, as a result, no budget and staff provisions were made to ensure continuity of the programme.

Conclusion

In the beginning the FMIS was a useful tool for updating farm management information on a regular basis. However, its sustainability depended on so many factors that in a sense contributed to its demise. One of the lessons learned is the fundamental issue that determines the continuity of any agricultural project, namely management's attitude and policy. If that changes, massive redirection can occur, as happened in this case.

The FMIS package should have been more flexible from the outset and could have been easily updated, without the need for consultants, to make it compatible with more modern computer spreadsheet programmes. In any case, any computer package has to be operated by staff. Continuity and sustainability depends either on retaining those staff or conducting on-the-job training for replacement staff based on an operational reference manual. Last but not least is the issue of budget or finance. Perhaps one way to safeguard is to view something such as FMIS as being part of the unit activity cost rather then being considered as a specific project.

Farm Diversification

By
Ilemeleki Kayanuanu, Fiji

Summary

This case study dealing with a large 7,000 hectare farm at the north western part of Ra Province explains the evolution of the farm as it moved away from being purely a beef ranch operation to a much more diversified farming system. It illustrates the benefits of keeping good records in order to derive production cost data and to relate that to prices in the market place. Such market price information can be helpful in decisions over what and when to produce and how to market the resulting production. The benefits of enterprise diversification in order to stabilise income from the farm are also given.

The Story

In the north western end of the Ra province in Fiji's main island of Viti Levu is located Fiji's version of a Texas cattle ranch. This 7,000 hectare ranch is on rolling hills covered with dry vegetation. Yaqara, a government run cattle ranch during the 1990's, is well known for producing the best beef in the country. This has changed in recent years as the farm has diversified into cropping. With increasing incidence of drought and a decline in forage vegetation during the dry season, management decided to embark on an alternative strategy that would stabilise returns during bad periods.

Sugar cane was selected as the best crop not only to supplement beef revenue but to serve as a source of forage for cattle during dry periods. Even though it provided some casual employment for people in the nearby villages, the management found it hard to meet rising labour costs because sugar cane is labour intensive. This left management with a dilemma!

In collaboration with agro-companies and the Ministry of Agriculture, the farm diversified into papaw production targeting the lucrative export market. The farm then came to appreciate the potential that existed in the production of horticultural crops utilising its irrigation system. As a result of a change in management during the last two years, the farm once again has introduced new crops into their operation. With assistance from the Republic of China (ROC) Technical Mission in Fiji,

the farm has been able to produce quality vegetables and fruits for the domestic market from a small area of 10 acres. Crops that have been introduced into the farm are capsicum, English cabbage, chilies, hybrid watermelon and eggplant. In addition to producing these crops, farm staff have also undergone on-the job training on simple techniques relating to horticultural production using the currently available resources.

Through such training, the farm has been able to manipulate the timing of harvest. For example, the farm was able to harvest ten tonnes of hybrid watermelon during the South Pacific Games. Even though production has improved, management has been faced with the dilemma of how to market their horticultural produce, especially watermelon. The Yaqara farm whilst harvesting their crop started looking for markets. Obviously it was not an easy task because of market forces. The first harvest of watermelon of about eight tonnes was taken to Suva during the South Pacific Games. Even though there were a lot of people in Suva during the games, the wholesale price of watermelon (i.e., the price retailers were paying farmers) went down to 80 cents per kilogramme. This was much lower than the retail price indicated in the Ministry of Agriculture weekly market survey which indicated a retail price at $2 per kilogramme.

Through consultation with management, the Yaqara farm secured themselves a table in the Suva main municipal market and sold their watermelon at $1.50 per kilogram retail. This was 50 cents lower then the middlemen retail price but they were able to manipulate the price since they knew that their breakeven price (i.e., the price that which they would cover their variable costs) was 70 cents per kilogramme. The decision to have a table of their own in the municipal market was a good one as they were also able to directly sell other produce such as capsicum, eggplant, English cabbage, chilies and pawpaw which, in some sense, complement each other thus reducing the total marketing cost.

So far things look good. However, prices for perishable products do change significantly and sometimes on a daily basis. The farm manager at Yaqara is now well positioned to access market price information which will help in decision making on his farm. What matters most in running a commercial farm is profit (*Tubu vakai lavo*).

Conclusion

Implications or lessons arising from the above case study are as follows:

- Decision making in running a commercial farm business is a continual process and influenced by two important elements: biophysical and socioeconomic. An example from this case study is the decision made by management to diversify into producing sugar cane for forage during the dry season and to make farm returns less volatile.
- Market price information helps empower farmers to make immediate decisions on pricing. An example from this case study was that they were able to compare the retail price in the municipal market (i.e., given by the Ministry of Agriculture market survey) with what middlemen were buying from the farmers, and with what price they could it sell for (i.e., since they knew their production costs). As a result of market research farmers can plan their production schedules to take advantage of seasonal price fluctuations.
- Part of the planning process for a farmer is to have some idea of the costs of producing and marketing different products. They can therefore be compared to find out which is most profitable. In the case study, management should have worked out the cost of growing sugar cane before venturing into it. They would then have better appreciated the potential problems relating to the high labour costs.
- Risk and uncertainty are two important issues for farmers irrespective whether they are semi-subsistence or commercial. Producing two or more commodities helps farmers lessen their risk and uncertainty since if one product is adversely affected by environmental or economic calamities, they are still able to get a return from others. The idea in this case study to diversify into crops is an example of the advantage of doing this.

The world today is very different than it was 50 years ago or even two decades ago. Changes are occurring more rapidly now than ever before. In the Pacific, the outside world now has a far greater influence on rural areas, villages, and farms than ever before, placing new demands on individuals who may need guidance as they begin to adapt to these dramatic changes.

This paper, unlike the other papers in this series, consists of a number of case studies written by different development practitioners in the Pacific Island Countries (PICs), describing the experiences of farming families, in making a transition to a more commercialised agriculture. They describe the challenges, rewards and problems they face in doing so. As a result a number of lessons can be drawn based on those experiences and, consequently, some of the more important ones are spelt out in an introductory chapter.

ISBN 92-5-105451-7 ISSN 1813-2332

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TC/M/Y5862E/1/12.05/1000