THE ECONOMICS OF AQUACULTURE IN COMPARISON WITH OTHER RURAL DEVELOPMENT OPPORTUNITIES IN PACIFIC ISLAND COUNTRIES

OUTCOMES OF A MEETING HELD AT THE UNIVERSITY OF THE SOUTH PACIFIC
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1.0 Introduction

Economic decision tools aim to assist farmers and potential investors understand the economic requirements, costs and benefits, and risks involved in production. Existing and future farmers can develop farm models based upon experience and apply it to decision-making and management.

Through the development of economic decision tools farmers can assess impacts such as disease, climate and market prices (known as externalities) that may influence profitability. They can also assess changes in profitability caused by changes in the cost of feed, labour, electricity, packaging and transport. Additionally, the decision tools can evaluate the economic effects of improvements in yield, future development plans, or a change in production efficiency.

Little or no information is available to farmers and interested investors about the establishment costs or the profitability of operating many enterprises that exist in Fiji. Prevailing market conditions make it very important to thoroughly research and identify markets for products before venturing into production. These comments apply to almost all industries, particularly aquaculture.

Developing an effective, sustainable and profitable enterprise requires a lot of time and capital input. By providing an economic analysis tool for farmers we aim to give them the knowledge and information necessary so they are fully prepared and understand the capital required, operating costs involved, the labour input and the profit margins they might expect to receive given an identified level of risk (such as the likelihood of crop damage by cyclones, or fluctuations in market price).

2.0 Background

Farming of fish, prawns or seaweed are new income-generating activities now being practiced in some Pacific island countries, including Fiji, as alternatives to fishing, copra, rice, dalo or sugarcane. Many people are interested in fish, prawn or seaweed farming but do not have enough information to decide whether they are worth doing. They need a way to compare these new activities with the other, more-familiar activities.

The income, expenditure and investment levels for any business will be different from place to place. Once an economic decision tool framework has been developed for each income-generating activity, it can be distributed on CD-ROM for rural development trainers or extension agents to use with people in an interactive way. Working with farmers to develop data inputs for models relevant to their particular situation will allow comparisons and decisions to be made regarding different income-generating activities.

3.0 Workshop Objectives

The primary focus of the workshop is to look at the possibility of aquaculture operations as alternatives to more traditional agricultural pursuits. Aquaculture enterprises are usually capital intensive, requiring substantial investment with extended payback periods. The ability of aquaculture enterprises to source investment, establish capital infrastructure and weather financial and operating expenses during inception has, in the past, been a major stumbling block for sustainable aquaculture industries. Variability in market prices and income flows also pose major hazards to establishing early profits and ensuring viability in the long term. The workshop aimed to provide a mechanism for discussion and a path for future development.

The objectives were to:

1. Develop ten focused *economic decision tools*, based upon cost benefit analysis, which people can use to compare alternative rural businesses in Fiji. A focus is placed on alternatives such as freshwater prawns (Macrobrachium), tilapia fish, shrimp, and seaweed aquaculture opportunities in comparison with more traditional terrestrial cropping activities like fishing, copra, rice, dalo, and sugarcane;

2. To consult with people who are experts in these income-generating activities and obtain necessary information to develop representative case studies for each enterprise. The participants will gain new skills and knowledge, and an understanding about their own businesses and how they compare with other businesses in the Pacific;

3. To study the risk analysis profiles of each enterprise.

4.0 Methods

The economic models are developed using the Microsoft Excel spreadsheet program and based upon the cost-benefit analysis technique. Cost-benefit analysis is a conceptual framework for the economic evaluation of projects with an aim to assist you to make a decision regarding the allocation of resources. In particular, it helps you to make decisions about whether or not to invest in an enterprise.

Discounted cash flow analysis was used to determine the annual cost structure and the likely profitability for each of the commodities. Discounting reduces future costs or benefits to an equivalent amount in today's dollars. People generally prefer to receive a given amount of money now rather than to receive the same amount in the future, because money has an opportunity cost. For example, if asked an amount of money they would just prefer to receive in 12 months' time in preference to $100 now, most people would nominate a figure around the $110 mark, to them money has an opportunity cost of around 10 %. A dollar tomorrow is not worth the same as a dollar today. Therefore, the timing and duration of these projects has an influence on the annualised costs and revenues of the project. The single amount calculated using the compound interest method is known as the present value (PV) of the future stream of costs and benefits. The rate used to calculate present value is known as the discount rate (opportunity cost of funds).

All the models developed assume a project life of 20 years and used a real discount rate of 8 per cent to calculate the net present value (NPV). The budgets also incorporate the initial capital and establishment costs.

Data input into the spreadsheet based models is simple, and is guided by two simple rules: **red** is a calculation cell and **yellow** is an input cell. Values (size of ponds, cost of labour, etc) can be entered into the yellow cells, while the values in the red cells are calculated from values entered by the user. The summary statistics also provide a break down of costs on a per kilogram basis.

Once the data is entered into the model the user can apply it to determine the impact of various management decisions. For example, the farmer may wish to know how a change in wages will affect his profit, or how introducing new varieties will effect production.

All the statistics are explained in the next section. The output includes the expected annual returns, when the farm is paid off and the maximum interest rate at which funds can be borrowed to invest in the project. Once an economic analysis has been done, this maximum interest rate figure should be taken into consideration when negotiating a bank loan for the project. The summary statistics also provide a break down of costs per unit (kg, tonnes etc).

5.0 Explanation of Terms

5.1 Net Present Value (NPV) and Equivalent Annual Return

The net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over the life of the project. If the NPV is positive the project is likely to be profitable. When the NPV is converted to a yearly figure it becomes annualised. In this report the annualised return is called the equivalent annual return. It is a measure of equivalent annual returns generated over the life of the project expressed in today's dollars.

5.2 Internal rate of return (IRR)

The discount rate at which the project has a NPV of zero is called the internal rate of return. The IRR represents the maximum rate of interest that could be paid on all capital invested in the project. If all funds were borrowed, and interest charged at the IRR, the borrower would break even, that is, recover the capital invested in the project.

5.3 Payback period

In the models a graph representing the cumulative cash flow is displayed. The year in which the cash flow rises above zero is considered the payback period. Payback period is a measure of the attractiveness of a project from the viewpoint of financial risk. Other things being equal, the project with the shortest payback period would be preferred. It is the period required for the cumulative NPV to become greater than zero and remain greater than zero over the life of the project.

5.4 Benefit – Cost Ratio

The benefit – cost ratio is simply a measure of the total flow of benefits over the life of the project as compared to the flow of costs. If the ratio is greater than one the project is deemed acceptable. In other words, the ratio describes the return per dollar invested; e.g. if the b-c ratio is 1.6 then we can say that for every $1.00 invested in the project or enterprise we get a return of $1.60.

5.5 Risk Analysis

Risk and uncertainty are features of most business and government activities and needs to be understood to ensure rational investment decisions. The process involves:

1. *Defining your model* – modelling business operations;
2. *Define our uncertain variables* – price and yield;
3. *Assign probability distributions for each of our uncertain variables* – allocating probabilities to our categories of minimum, poor, average, good and maximum;

4. *Run the simulation and analyse the results* – for our risk analysis we have displayed the results using a cumulative probability distribution.

The best way to demonstrate how we input information for the risk analysis and interpret the results is with an example. Consider a tilapia farm: we need to first specify the likelihood of various risk factors affecting production (or yield). In the following table, risk factors (cyclone, theft, etc) are listed and then the probability of each of these is stated in the 'Probability' column, with reference to the description in the 'Occurs' column.

Table 1. Expected risks for example tilapia farm

	Risk Factors	Occurs	Probability	Cumulative
Zero to Poor	Cyclone, severe disease and flood	1 in 10 years	**0.1 (or 10%)**	**0.1**
Poor to Average	Theft, some disease, lack of stock supplies	2 in 10 years	**0.2 (or 20%)**	**0.3**
Average to Good	Good conditions, minimal disease, good feed	4 in 10 years	**0.4 (or 40%)**	**0.7**
Good to Maximum	Excellent growing conditions, no disease	3 in 10 years	**0.3 (or 30%)**	**1.0**

As you will see in the table above, data is entered in the 'Probability' column resulting in the cumulative percentages shown in the 'Cumulative' column. The user then enters the expected production or yield (as in the table below). We do not need to enter the minimum or the maximum probabilities, nor their associated production.

Table 2. Risk input pro forma for example tilapia farm

	Kilograms of Tilapia	Cumulative Probability
Minimum	**0**	**0.00**
Poor	**20,000**	**0.10**
Average	**25,000**	**0.30**
Good	**27,500**	**0.70**
Maximum	**30,000**	**1.00**

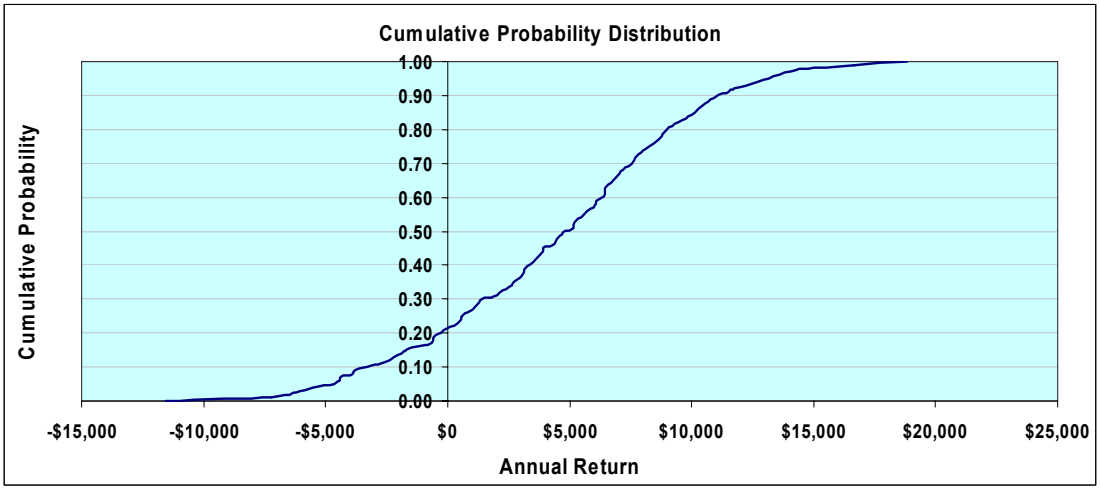
This table indicates that we have:

10% chance of producing **0 to 20,000** kg (Minimum to Poor)
20% chance of producing **20,000 to 25,000** kg (Poor to Average)
40% chance of producing **25,000 to 27,500** kg (Average to Good)
30% chance of producing **27,500 to 30,000** kg (Good to Maximum)

The same process is followed for the price risk, except that the minimum and maximum prices have not been set for you (they are in yellow). The minimum price may not be zero; it may be a subsidised price set by the government or an historical market low. Once all the data are entered we can run the simulation. Once the simulation has run its course we will have produced a set of results that is graphically shown as a cumulative probability distribution.

This graph shows the entire range of outcomes possible, given our inputs, for the enterprise.

Figure 1. Cumulative probability distribution for example tilapia farm



We can see that our annual return is represented along the x-axis and the probabilities on the y-axis. In the tilapia example, with the costs and prices as specified in the input (yellow) cells, the cumulative probability curve crosses the $0 return point at approximately 0.2. This can be interpreted as meaning that **a 20% exists chance of making an annual return of less than $0** (making a loss for the year). Alternatively, a line drawn vertically from the $10,000 mark on the horizontal axis meets the curve at about 0.8 (projecting across to the vertical axis), from which we can say that **there is a 80% chance of earning less than $10,000**; and so on.

6.0 Issues Raised

The meeting divided into small-groups to consider how appropriate the draft models were for each commodity in a Pacific island setting, and to what extent they would need to have regard for any unique economic or cultural circumstances existing in small island states compared with more metropolitan countries. These issues were then reported back and discussed in plenary sessions. The main issues raised by the meeting are reported below.

7.0 Risk Profiles of Selected Crops

To identify and quantify risk when using the economic models, every locality and commodity will be different. Some people using the models (for example, banks) may not have the same familiarity with the various kinds of risk associated with each commodity as people who work with them on a day-to-day basis. Such people will need to be provided with some realistic probabilities for typical risks, to ensure the most accurate results possible.

One objective of the meeting was to invite participants, who are experts in the various commodities, to identify and quantify the main risks associated with their businesses. The risk profiles that emerged for each commodity are provided below.

Table 3. Perceived risk and associated impacts for Tilapia

Tilapia Risk Events	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 50% Infrastructure losses
Drought	20% (1 in 5 yrs)	Production loss - 50%
Theft	Unknown	Production loss - 10%
Feed Supply Interrupted	16% (1 in 6 yrs)	Production loss - unquantified
Fry Supply Interrupted	25% (1 in 4 yrs)	Production loss - unquantified
Lack of Market Outlets	Unknown	Profit loss - unquantified
Technical Advice Limited	Unknown	Production loss - unquantified

Table 4. Perceived risk and associated impacts for Freshwater Prawns

Macrobrachium Risk Events	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 50% Infrastructure losses
Drought	20% (1 in 5 yrs)	Production loss - 50%
Theft	Unknown	Production loss - 10%
Feed Supply Interrupted	25% (1 in 4 yrs)	Production loss - unquantified
PL Supply Interrupted	25% (1 in 4 yrs)	Production loss - unquantified
PL Mortality on Delivery	100% (All years)	Production loss – 20 to 50%
Technical Advice Limited	Unknown	Production loss - unquantified

Table 5. Perceived risk events and associated impacts for Seaweed

Seaweed Risk Events	Probability	Impact
Cyclone	10% (1 in 10 yrs)	Production loss – 16.6% Infrastructure losses
Strong Waves	100% (All years)	Production loss - 10%
Disease	100% (All years)	Production loss - 10%
Grazing	100% (All years)	Production loss - 5%
Marketing	Unknown	Production loss - unquantified

Note: the model for seaweed uses "dry weight of one line" as its estimator of production. Any figures available for these from test plots will have losses for disease and grazing already built into them on a per line basis. Loss of entire lines due to strong waves would need to be estimated separately for input into the model.

Table 6. Perceived risk events and associated impacts for Fishing

Risk Event	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 10% Infrastructure loss - 50%
Hot Season	10% (1 in 10 yrs)	Production loss - 10%
Theft	100% (All years)	Production loss - 10%
Market Glut	33% (1 in 3 yrs)	Profit loss - unquantified
Environmental – pollution, fish kills etc.	100% (All years)	Production loss - 5%
Overfishing	100% (All years)	Production loss - 10%

Table 7. Perceived risk events and associated impacts for Copra

Risk Event	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 80% Infrastructure loss - 80%
Drought	10% (1 in 10 yrs)	Production loss - 30%
Flood	20% (1 in 5 yrs)	Production loss - 10%
Pests	100% (All years)	Production loss - 5%

Table 8. Perceived risk events and associated impacts for Rice

Risk Event	Probability	Impact
Disease	100% (All years)	Production loss - 30%
Drought	20% (1 in 5 yrs)	Production loss - unquantified
Grazing	100% (All years)	Production loss - 10%
Marketing	Unknown	Profit loss - unquantified

Table 9. Perceived risk events and associated impacts for Sugarcane

Risk Event	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 50% Infrastructure loss - 50%
Drought	33% (1 in 3 yrs)	Production loss - 25%
Fire	100% (All years)	Production loss - 30%
Mill Breakdown	50% (1 in 2 yrs)	Production loss - 5%
Cane Not Harvested	20% (1 in 5 yrs)	Production loss - 25%

Table 10. Perceived risk events and associated impacts for Dalo

Risk Event	Probability	Impact
Cyclone	20% (1 in 5 yrs)	Production loss - 30% Infrastructure loss - 40%
Drought	20% (1 in 5 yrs)	Production loss - 40%
Market Glut	Unknown	Profit loss - unquantified
Theft	Unknown	Production loss - 10%
Damage by Livestock	Unknown	Production loss - 5%

8.0 Should Business Owners "Pay" Themselves?

While identifying costs for inclusion in the economic model framework, there was a tendency for meeting participants not to place any value on the time contributed by the owner of the business or the owner's immediate family. Rather, this time and labour was treated as non-value good. It was assumed that the return to owner labour and management would only be realised when the business generated sufficient profit.

The fundamental problem with this way of thinking is that it distorts the decision to undertake that particular enterprise by underestimating the true cost of labour. If the business is able to generate sufficient revenues to compensate owner or family labour, plus all other operating (fixed and variable) and capital expenses, then the enterprise would be deemed profitable. If the enterprise returns a profit solely based on unpaid labour then the decision to undertake that enterprise would be based on false economies.

There is a basic requirement to supply food and shelter (subsistence). If the enterprise selected does not meet this need then it should not be undertaken, unless it provides a direct food supply to the family.

Consideration must be given to the opportunity cost of labour. An economic value needs to be placed upon the time the business owner and his family devote to the enterprise, so that they can assess whether they are better off to be engaged in that business or in some other economic pursuit. Anybody using these economic models should estimate the cost of that labour, regardless of whether or not actual monies are to be drawn from the business to the owner or their family.

9.0 Customary Obligations

A feature of traditional societies in Pacific Island countries are customary obligations to kin and a reciprocity of exchange in material possessions or cash, whereby the measure of a person is not by how much they own, but rather by how much they can give. This has long been seen as an obstacle to progress in the development of a small-business sector among such societies. Participants raised the issue that the economic models being developed for the various commodities should consider the burden of traditional obligations.

Customary obligations were seen as an additional cost to the business which could manifest in either, or both of two ways - firstly money or livestock might be taken out of the business and thus reduce income, and secondly, machinery, equipment or facilities owned by the business might be borrowed for use by others, and thus be unavailable for the business, or suffer accelerated wear and tear.

No quick or easy solution was found by the meeting for this issue, however this is not surprising as it has been a focus of the Pacific economic-development debate for many years.

There were two schools of thought about the nature of the issue itself. Some expressed the view that it is a uniquely indigenous Fijian problem not experienced by other ethnic groups. Other participants mentioned that businesses within other ethnic groups can also have pressures to make contributions or donations unrelated to the business, the only difference being the extent or degree to which this is done.

A view was raised that customary obligations should be included as a variable cost in the structure of the business, and be a focus of sensitivity analysis to determine what level of customary obligation the business can bear.

Similar to unpaid labour, the abovementioned viewpoint can distort decision-making. Such obligations should be treated as external to the business structure, and should be met from any profits generated from the business activity, above all incurred costs to the business owner.

This highlights the need for a business owner to effectively budget for these costs and be aware of the limits on the amounts that can be treated as profit. The economic models developed during this meeting can be useful for this. Once aware of the limits, each business owner will need to develop their own social or cultural strategies to try and remain within them.

10. Acknowledgements

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Appendix 1: Summary of Results

	Pr	An	Cc	Rc	An	BC	IR
Tilapia Fish	1.0	26.3 tonnes per ha	$2,490 per tonne	$4,000 per tonne	**$39,785**	**1.61**	**41.4 %**
Freshwater Prawns	0.45	3.5 tonnes per ha	$11,130 per tonne	$15,000 per tonne	**$6,100**	**1.35**	**32.3 %**
Shrimp	7.0	2.9 tonnes per ha	$13,950 per tonne	$15,300 per tonne	**$27,052**	**1.10**	**16.5 %**
Seaweed (Commercial)	510 km of line	2.5 tonnes per km	$640 per tonne	$1,100 per tonne	**$300,717**	**1.73**	**78.0 %**
Seaweed (Semi-commercial)	12 km of line	4.0 tonnes per km	$490 per tonne	$500 per tonne	**$296**	**1.02**	**10.8 %**
Fishing (Net)	-	9 tonnes	$1,070 per tonne	$2,000 per tonne	**$8,346**	**1.86**	**228.4 %**
Fishing (Line)	-	12 tonnes	$2,310 per tonne	$4,050 per tonne	**$20,908**	**1.76**	**69.5 %**
Rice (Broadcast)	3.3	3.75 tonnes per ha	$355 per tonne	$600 per tonne	**$3,035**	**1.69**	**60.8 %**
Rice (Transplant)	3.3	4.5 tonnes per ha	$301 per tonne	$600 per tonne	**$4,440**	**1.99**	**84.5 %**
Copra	50.0	0.8 tonnes per ha	$505 per tonne	$500 per tonne	**- $120**	**0.99**	**5.8 %**
Dalo	5.0	15.2 tonnes per ha	$409 per tonne	$942 per tonne	**$40,804**	**2.30**	**62.4 %**
Sugarcane	9.5	90.6 tonnes per ha	$23 per tonne	$55 per tonne	**$19,407**	**2.40**	**25.8 %**

1. These figures are based on the values given at the workshop; they are likely to be different at other scales of production or in other places, even within Fiji, and should be used to give a general indication only.
2. Annual return figures are calculated after the owner and all wages have been paid.

Appendix 2: Participant Feedback

At the conclusion of the workshop, participants were invited to anonymously provide feedback about the meeting, by filling out a four-question feedback form. The questions, along with verbatim responses, are provided here.

Question 1: What did you like about this meeting?

- The data input and procedures were very simple and time saving.
- The meeting was exceptionally good. The commodity models gave me a thorough understanding on how other projects work. It gave me a clear vision on which commodity is viable.
- The informality and how the workshop was conducted were excellent. Just using the Excel program and how powerful it can be in cash flows teaches us so much. New ideas have emerged when comparing the viability of commodities. It taught me how to work effectively from the government officer's point of view with regard to project design and documentation.
- I like it because it gives me a very good idea and clear vision of how to be a success in farming.
- The chance to get a first hand view of what the other farms apart from copra is making and their risks and viability.
- The comparisons between different commodities are very informative.
- The presentations were of advanced quality yet simple to understand. The presenters made the meeting look so simple and informal.
- The meeting really opened a true way of working e.g. tell the farmer when he will earn his money back, what size of farm is required and so on.
- The venue was very good. Presentations were excellent with simple terms used to suit the farmer. The cooperation from fisheries staff and farmers was very good.
- The workshop has been helpful to us farmers especially the bar graphs and statistics. It really helps us to know whether our productivity is going up or down.
- Presentation was easy and I learnt about other commodities.
- I enjoyed the informal approach that has encouraged a free flow exchange of views and ideas.
- A good learning experience. Studying the economic viability of agricultural and aquaculture products is something new in the sense that the model presentations has been precise and factual. It helps me a lot in providing information to banking agencies that can come in to lend or assist on loans for applicants venturing in to the fishing business.
- A very enlightening workshop, in particular, for us technical staff where we lack the knowledge to relate projects to economic analysis, terms and conditions in a more simplified manner. Very helpful meeting.
- The meeting was very useful for all the commodities as you gain more ideas of each commodity.
- It gave me time to share what I am doing in my fishing business. It gave me a good picture of what I am actually earning. It will help me develop my business. Good allowance.
- I personally have gained a lot of knowledge of how to manage my farm especially the financial part of it. The importance of highlighting all

expenses that may occur. Met a lot of new friends and learnt about other commodities. Allowance was good and so was the food. Sound system and lighting was good.
- I learnt a lot about how to run my farm and information about other farms. I learnt new things and the food and allowance was good.
- I learnt how to develop my commodities (fishing).
- It's a great eye opener. First of all coming from a remote area and meeting different kinds of people from different fields offering their views on commodities they operate and gaining such valuable information which will enhance the groups chance of success.
- I like the easy way the coordinator conducted it. It helped me understand the commodity that I am involved in. The meeting helped me develop future business plans. It helped me to look at customary obligations as a big issue to Fijian business people. Now I can pay myself.

Question 2: What didn't you like about the meeting?
- Participants not actively participating in the data inputting. Shows a lack of record keeping and negligence on their part.
- The models are, sometimes, confusing.
- Insufficient laptops for each of the working groups.
- Nil.
- Everything was OK and run professionally.
- Emphasis on only a few commodities.
- Not being able to get a hold of a CD of the computerised worksheet so that we could have a play around with the figures. Uneven distribution of allowances.
- I couldn't calculate labour costs the way the models did.
- I do not like the participants that did not participate in the meeting.
- Lunch is not provided.
- Nothing.
- Some of the calculations are not clear e.g. the economic indicators. More elaboration on how the calculations were done, especially when we have to explain to farmers.
- I would have preferred that all the participants be accommodated in one venue to avoid early morning rush to the meeting site and also give the participants various backgrounds to commodities and more time to discuss the economics of their projects.
- Sometimes it was confusing.
- Nothing.
- Nothing.
- I liked everything.
- Nothing.
- What I disliked was how short the meeting was, bearing in mind that some of us are first comers to such an institute (USP) and are proud to go back to the countryside and reveal the secret of such information in which we are not so aware of.
- Nothing.
- Nil.

Question 3: How could the meeting be improved?

- Each participant has access to a computer while in training to experience the hands on exercises.
- More workshops in the future.
- Allocate each small work group a computer to allow themselves to fiddle with the Excel programs.
- It can be improved by having more workshops.
- Could be improved by having more accurate figures or having different kinds of copra farmers participating.
- More hands on required. Maybe the workshop to be held in a computer lab with each person having access to a computer to work on the economic models.
- Each participant should be given a CD of exercises being carried out for our own modification.
- The meeting was really good. Nothing to change.
- Increase the number of participants from the cropping section.
- This meeting is pretty good, but would have been better if we the participants get a chance to use or learn computers.
- Extend it for another week.
- More participation from stakeholders. Selection of participants should be based on different areas and different experiences. More women participants.
- Each work group to work on two separate case studies i.e. shrimp v tilapia or fishing v prawn etc.
- By going to the farm areas.
- By doing it regularly and invite more participants who get more experience.
- I am satisfied with everything.
- Satisfied.
- To do it every month. More facilities to be provided.
- If some other commodities could be brought to attention, so they can view their ideas, so more can be put up as a challenge to leave or to take the present project we are doing at the moment.
- Nothing.
- A brief introduction by each of the participants at the beginning of the seminar

Question 4: Are there any other comments?

- Nothing.
- We took the rice model and we saw that the annual return for rice was only a few thousand dollars. I think that the Rewa Rice Company, the sole buyer for rice in Fiji, should have been invited to comment on the price for rice.
- More workshops. Include lunch.
- Thank you very much for inviting me to this workshop. I hope you will remember me for future workshops.
- On the whole everything went well and I must thank the four computer men for their help and time. Thanks!
- None.

- None.
- I would like to thank the organiser of the meeting. Can the models be translated into Fijian and Indian?
- None.
- None.
- None.
- Need a presentation from banking agencies. With regards to how to apply for loans and get endorsing of a loan. I want to thank the organisers for inviting me to the meeting. I have really learnt a lot of new things and enhanced my knowledge and skills on how to carry out economic analysis of an aquaculture commodity in the area I want.
- None.
- There should be a Rewa Rice representative in a workshop like this.
- None.
- Can we hardcopies or disk please? Thank you for everything and God Bless.
- No.
- No comment.
- Thanks to the staff of USP, and especially to Bill (the economist from Australia) for giving his time and information on how different projects can be generated to full commercial level, for good selection and lift the standard of living. Vinaka.
- Could other meetings be conducted like this one at the farmers level on different commodities such as dalo, rourou, poultry and copra?
- A well organised meeting which I have found to be very informative. Refreshments were excellent.

Appendix 3: List of participants

Number	Name	Commodity	Contact address
1	Abdul Sidiq	Tilapia	Nausori
2	Ledua Vuli	Tilapia	Nausori
3	Savenaca Vodio	Prawn	Nausori
4	Robin Mercer	Prawn, Copra	Savusavu
5	Sefanaia Temo	Taro	Agriculture
6	Josese Veibataki	Taro	Nausori
7	Ramesh Lal	Rice	Dreketi
8	Salesh Kumar	Rice	Dreketi
9	Edward Emberson	Copra	Savusavu
10	Yani Ligaiviu	Copra	Savusavu
11	Dilo Bunoa	Fishing	Dromuna Village, Tailevu
12	Livai Lote	Fishing	Kiuva Village, Tailevu
13	Sadhu Prasad	Seaweed	Labasa
14	Asaeli Bale	Seaweed	Ono-I- Lau
15	Bhakt Reddy	Sugar cane	Nadi
16	Filimoni Mate	Observers	Fiji Department of Fisheries
17	Tavenisa Vereivalu	Observer	Fiji Department of Fisheries
18	Maleli Dawai	Observer	Fiji Department of Fisheries
19	Sam Mario	Observer	Fiji Department of Fisheries
20	Ben Saqata	Observer	Fiji Department of Fisheries
21	Sashi Karan	Observer	Fiji Department of Fisheries
22	Anita Sharma	Observer	ANZ Bank
23	Narrain Kumar	Observer	ANZ Bank
24	Paula Rakai	Observer	Fiji Development Bank
25	Lynette Kumar	Observer	MSP
26	Veena Ram Bidesi	Observer	MSP
27	Kaminieli Veibataki	Observer	Nausori Agriculture Station
28	Warwick Nash	Observer	World Fish Centre
29	Ben Ponia	Observer	SPC
30	Semisi Naivalu	Observer	Fiji Department of Fisheries
31	Jovesa Naceva	Observer	Fiji Department of Fisheries

Number	Resource Persons	Position	Organisation
1	William Johnston	Consultant	QLD Dept of Primary Industries
2	Tim Pickering	Coordinator	MSP
3	Satya Nandlal	Coordinator	IMR
4	Ferral Lasi	Resource	MSP
5	Mere Namudu	Resource	MSP