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DATA PARAMETERS FOR ECONOMIC ANALYSIS

USAID PACIFIC ISLANDS MARINE RESOURCES PROJECT - TONGA
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Prepared by:

Peter Philipson

Prepared for:

Agricultural Cooperative Development International
50 F Street, N.W.
Suite 900
Washington, DC 20001, USA
Phone: (202) 638-4661
Facsimile: (202) 626-8726
Telex: 160923 AGCODEV

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EXECUTIVE SUMMARY

Procedures and forms for the collection of economic data in the USAID Tonga small scale tuna fishing project are outlined in this report. The methodology used has been to design pro forma analysis layouts, and use them to derive data collection requirements.

It has been recognised that it would be desirable to combine the economic analysis data collection needs with the information/ reporting requirements of other components in the project, for example resource assessment and Tongan administrative requirements, to minimise the collection load. This has been accomplished by designing, in collaboration with the Fisheries Development Advisor, forms that collect multi-purpose data.

It is recommended that the economist's first fieldwork visit be timed to enable him to be present in Vava'u during the end of period activities, before preparing the project analysis for the first period. This visit is currently scheduled for September 15 to October 14, 1993. It should be confirmed that this includes the balance day, which would be September 30, on this basis.

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1.0 Introduction

1.1 Scope of work

The purpose of this brief presentation is to identify and describe the requirements for the collection of economic data for the USAID/ RDA/ ACDI small scale tuna fishing project based in Vava'u, Tonga. This data is to be used to analyze the economic efficiency and potential commercial viability of the various vessels and gear types trialled during the course of the project.

The scope of work contained in the economic analysis of the small scale tuna fishing activity can be summarised as follows;

(a) Detailed analysis and comparison of the costs of various vessels, fishing grounds and gear types trialled during the project will be prepared;

(b) Based on market returns and distribution costs determined during the project, profitability of the various options will be assessed;

(c) Based on (a) and (b) above, the most appropriate mode of operation will be selected and detailed projections of potential returns to commercial operators estimated.

1.2 Methodology

The methodology of determining data collection requirements is to develop, in Section 2 herein, the pro forma analysis that will be produced later in the project to satisfy the scope of work above. The data collection procedures are derived from the information requirements of the pro forma analysis.

In practice, it would be desirable to combine the economic analysis data collection needs with the information/ reporting requirements of other components in the project, for example resource assessment and Tongan administrative requirements, to minimise the collection load. Data collection forms annexed to this report have been developed with this in mind.

It is recommended that the economist responsible for the preparation of the first analysis (following approximately eighteen months operations) conduct the fieldwork during the period immediately before and after the reporting date. This will enable him to supervise and assist in the end of period activities, including stocktakes, determination of receivables and payables, and the reconciliation of accounts as at balance date. Current scheduling of the economist's visit indicates that the reporting date is September 30, 1993; this should be confirmed.

2.0 Pro forma analysis

2.1 Introduction

Pro forma analysis tables for the economic evaluation that will follow the first period of operations are set out in the following three pages.

As the project develops over that period, it is likely that the objectives will evolve, and possibly change to some extent. As the purpose of the economic evaluation is principally to measure the degree to which objectives have been met, it is certain that the pro forma analysis layouts will be modified at the time of the first evaluation. Additionally, it may not prove practical, or desirable, to follow some of the assumptions incorporated in the pro forma layouts.

Nonetheless, the layouts below still provide the best indicators of information requirements. Where appropriate, figures are shown individually for each vessel.

2.2 Pro forma tables

The tables on the following three pages set out pro forma economic analysis tables for the project.

Table 1: Vessel operating summaries - longliners

	Vessel	28 ft	35 ft	40 ft
1	Days fishing	99	99	99
2	Days transit	99	99	99
3	Days waiting & provisioning	99	99	
4	Days unloading	99		
5	Days other (weather etc.)	99		
6	Days total	99		
7	Average daily catch	99		
8	Bigeye	9		
9	Yellowfin	9		
10	Other	9		
11	Completed trips	99		
12	Total catch			
13	Bigeye	999		
14	Yellowfin	999		
15	Other	999		
16	Total	999		

Table 2: Vessel operating costs - longliners

	Vessel	28 ft	35 ft	40 ft
17	Fuel	999	999	999
18	Lube oils	999	999	999
19	Bait	999	999	
20	Ice	999		
21	Crewshare	999		
22	Galley/Provisions	999		
23	Variable catching costs	999		
24	Repairs and maintenance - vessel	999		
25	Repairs and maintenance - gear	999		
26	FAD operating costs	999		
27	Administration	999		
28	Vessel insurance	999		
29	Fixed catching costs	999		
30	Total operating costs	999		
31	Interest	999		
32	Depreciation	999		
33	Total production costs	999		

Table 3: Catching efficiency

	Gear/ location/ etc. (See notes below)	1	2	3	4	5	6	7
34								
35	Catch							
	Bigeye							
	Yellowfin							
	Other							
36	Hooks set							
37	Catch per 100 hooks							
	Bigeye							
	Yellowfin							
	Other							
38	Overall catch per 100 hooks							
39	Days fishing							
40	Catch per fishing day							
	Bigeye							
	Yellowfin							
	Other							
41	Overall catch per fishing day							

1. Horizontal longline/ seamount + FAD/ imported bait
2. Horizontal longline/ seamount + FAD/ local bait
3. Horizontal longline/ seamount only/ imported bait
4. Horizontal longline/ seamount only/ local bait
5. Vertical longline/ seamount + FAD/ imported bait
6. etc. per trial fishing plan.
7. etc.

Table 4: Net Income

	Vessel	28 ft	35 ft	40 ft
42	Gross export sales	999		
	Less Sales expenses			
43	Freight	99		
44	Sales commission	99		
45	Packaging materials etc.	99		
46	Shipping labour	99		
47	Other	99		
48	Net export sales	999		
49	Local sales	99		
50	Total sales	99		
51	Less Longline production costs	999		
52	Over/ under recovery of baitfish costs	999		
53	Net Income	999		

Table 5: Working capital

54	(a) Accounts receivable	999
55	(b) Inventory	
56	- Vessel spares	999
57	- Fishing spares	999
58	- Frozen bait	999
59	- Other	999
60	(c) Cash in hand	999
61	(d) Accounts payable	999

3.0 Data collection requirements

3.1 General

This first section reviews the pro forma analysis tables line by line and comments on the data collection requirements and procedures.

line numbers per
pro forma tables

[lines 1 - 6] Longline vessel activity. It is desirable to complete the analysis of vessel activity summarised in lines 1 - 6 in the pro forma layout. This will require logging vessel activity for each vessel for each day over the eighteen month period.

[lines 7 - 10] Catch data. Catch data on a specie/ per 100 hook level will be generated for biological assessment. It is also needed for economic analysis, for identification of trends and inter-vessel variances. Daily catch means catch per day fishing. This data will be gathered on form F1.

[line 11] Completed trips during the eighteen month period. Determined from the vessel activity logs required for lines 1 - 6.

[line 12 - 16] Total catch over the eighteen month period sourced per lines 7 - 10.

[line 17] Fuel. As individual vessel results are required, records of fuel issues to each vessel will be have to be recorded in an issues book, or similar. Fuel issues should be recorded by quantity supplied; cost records should not be used at this point. Form F1 also requires a fuel use entry by the captain for the trip.

As part of the end of period accounting process, the sum of the individual charges allocated to vessels via the issues book will be agreed to the total fuel used by the project (i.e. purchases adjusted for stock holdings). There will also be a need, on a spot check basis, for reconciling issues with recorded F1 usage.

Of course, eighteen months is far too long a period to allow before such a check on systems integrity, stock irregularities etc. is carried out, so project management will no doubt wish to carry this out more frequently. This comment relates to a number of other items, such as provisions, bait and engine spares.

[line 18] Lube oils. As per fuel line 17 above.

[line 19] Bait. Issue records of bait used by each boat will need to be kept in the same way as fuel, as individual vessel results are required. Issues should be recorded by weight, for later costing based on calculated values. Form F1 also requires the captain to record per trip bait usage.

As with fuel, periodic and balance day checks will be needed to reconcile recorded issues with total bait landings and purchases. A transfer price of the bait from the bait boats to the longliners will be required where local bait is used; choices are transfer at cost, or at some imputed price, perhaps the cost of imported bait. The later will allow the bait operation to be run as a profit center, the former as a cost center.

[line 20] Ice. Similar recording procedures as for bait above. Also required from the captains on form F1.

[line 21] Crewshare. To be accessed from office pay records, crew lists etc.

[line 22] Galley/ Provisions. In principle, victuals should be accounted for in the same way as bait and fuel, by recording individual issues and reconciling with bulk purchases. However, while fuel and bait issues should be recorded in quantitative units in the issue book (i.e. litres for fuel and kg/ cartons for bait) it would be more efficient to record the issue of victuals in terms of monetary value. Thus the person responsible for re-provisioning the vessel should make up the victuals required for the forthcoming trip and prepare the corresponding docket. The docket should show the item, quantity, unit cost, and extension. The docket should be totalled and signed as received by the responsible crew member. Example below; a normal commercial delivery docket book could be used for this purpose.

Vessel	Date../../..	Docket #	
Item	Quantity	Unit cost	Total cost
Sweet potatoes	2 Baskets	4.00	8.00
Rice	One 20 kg bag	15.00	15.00
Tin fish	2 cartons	50.00	100.00
Etc.			
		Total	200.00

Received the above .....

[line 24] Repairs and maintenance - vessel. Accurate accounting for this expense can present a number of difficulties. It will be up to project management to decide whether the effort and expense of tracking R & M accurately, particularly on an individual vessel basis, is worth the information provided. For example, if a batch of parts arrive, their individual costs will need to be recorded, and an appropriate portion of the

freight etc. added to each unit cost. This cost will need to be attached to the part (possibly subject to adjustment on some averaging formula, if stocks of the same part are already held, as is usual). Equity problems arise if, for example, a part needs to be air-freighted. Should the airfreight cost be charged to the boat? Or to overheads? Perhaps lines 24 - 28 should be presented as a fleet-wide total.

[line 25] Repairs and maintenance - gear. Same comments as line 23, with specific accuracy problems. For example, if a whole set of gear is taken off a vessel for repair and placement in reserve, how are the repair costs accounted for?

[line 26] FAD operating costs. This cost will be accessed from office records. Clearly not directly attributable to individual boats, although it could be allocated on a FAD usage basis. This would have limited value.

[line 27] Administration. This is designed to catch all the overheads apart from those specifically designated elsewhere. However, in the case of the Tonga project, many of the overheads (for example economic analysis costs) should not be allocated to the fishing operation proper, due to the developmental nature of this project. Decisions on just which management/ overhead costs should be included could be deferred until end of period accounting, but will have a major impact on vessel profitability.

[line 27] Vessel insurance. No recording required.

[line 31 - 32] Interest and depreciation. No record keeping required.

[line 35] Catch (by gear location etc.). Table 3 is designed to summarise the results of trial fishing techniques and will draw its data from the consolidated fishing activities of all the boats. As in other areas, there will be a need

to reconcile catch totals summarised in this table with the totals of individual vessel's catch reports (form F2). This will need to done on an ongoing basis.

[line 36] Hooks set. From form F1.

[line 37] Catch per 100 hooks. From form F1/ F2.

[line 39] Days fishing. From vessel logs and form F1.

[line 42] Gross export sales. The actual sales value realised by the fish which is sold to export markets, before all deductions. As individual vessel reporting of profitability is required, shipments (or individual fish in mixed shipments) will need to be segregated by vessel. This will also need to converted to Pa'anga, as will many of the sales expenses.

As sales prices will vary due to factors which are not related to the vessel, and certainly not the gear type, assessing individual vessel profitability based on actual realisations may need to be re-evaluated. An average sales return might be more appropriate.

Sales information for this purpose is recorded initially on form F3, and will be converted and entered in the office sales ledger. By entering each fish in the sales ledger at the time of receipt from the vessel, the analysis book would also serve as a register to ensure all fish are accounted for in the marketing process (including annotations for discards and local sales).

[line 43] Freight. Air freight and associated charges for the exported fish. This item, and those recorded in lines 44 - 47, will be sourced from the office sales ledger.

[line 44 - 47] Other sales expenses. Entered in sales ledger as part of office bookkeeping procedures.

[line 49] Local sales. Office records of cash and local sales and summarised into the sales ledger/ subsidiary ledger.

[line 50 - 51] No recording required.

[line 52] Baitfish costs. Accounting adjustment to bring in baitfish cost that may not have been fully (or over) accounted for, depending on method of handling transfer costs of baitfish to longliners. No recording required.

[line 54] Accounts receivable. Will consist of fish shipped but not paid for and local credit sales. Will be determined as part of end of period activities, from invoices and shipment records.

[line 55 - 59] Inventory. It will be necessary to inventory all items purchased during the eighteen month period, but which remain unused. This involves not only the physical counting, which occurs at the end of period, but also the valuation of the stocks. This in turn requires records of the purchase and delivery costs of the items in stock. It is probably not worthwhile setting up inventory systems to run during the course of the project (financial, that is - operational requirements for stock management are another matter). Stock value could be calculated by reference to purchase invoices and other records at the end of period.

[line 60] Cash in hand. Based on reconciled bank accounts (i.e. adjusted for outstanding checks etc.) petty cash, etc. analyzed at end of period.

[line 61] Accounts payable. Amounts due but unpaid at end of period. The project order book, for both overseas and local credit purchases (fuel, for example), will be the primary source. Goods in transit from overseas (including Nuku'alofa) will need careful handling.

3.2 Per trip information recording

The table below summarises the information that should be recorded from each trip. Forms F1 and F2 have been designed to gather this information, along with other data not directly related to economic analysis.

Table 1. Information required from each trip

Item	Unit	Source (other than forms F1 & F2)
Fuel	Litres	Fuel issues book
Lube oil	Litres	Engineering store records
Bait	Kg	Bait issue records
Crewshare	$T	Office pay records
Galley/ provisions	$T	Duplicate copy in provisions docket book
Ice	Kg	Ice issues
Gear usage	$T	Office records

3.3 Per shipment information recording

Without attempting to spell out appropriate office procedures, it would be common to use the marketing form (F3) as a cover sheet and summary for the each shipment, and hold all related documents under the cover sheet, in a separate folder for each shipment. As touched on above, summarisation and reconciliation of sales returns could take place in a sales analysis book, with a line by line cross reference to the relevant document folder.

Table 2. Information required from each shipment

Item	Unit	Source
Gross sales		Auction statements, etc.
Freight		Air way bill
Sales commission		Agents returns
Packaging materials		Office records
Shipping labour		Office records
Other		Office records
Conversion rate	-	Sales documents, banking records

Annexe 1. Data collection forms

F1 - Trip report
F2 - Catch report
F3 - Marketing shipment summary

RDA INTERNATIONAL – SMALL SCALE TUNA FISHING PROJECT – TONGA

TRIP REPORT

Captain..... ..... Vessel ..... Trip # .....

Departed.... ..../..../.... Returned ..../..../....

Date	Set #	Gear Type (LV/LH/H/T)	Start	Finish	On FAD ✓	On S/Mnt ✓	Grid No.	Hooks set #	Bait Local Import	Sea temp	Depth (m)	Remarks

Fuel consumed ..... (litres) Galley/ Provisions .....($) Gear .....($)

Bait used ..... (kg) Ice .....(kg)

Form F1 – Trip Report (sets)

RDA INTERNATIONAL – SMALL SCALE TUNA FISHING PROJECT – TONGA

CATCH REPORT

Captain ..... Trip # ..... Vessel .....

Date	Set #	Yellowfin		Bigeye		Albacore		Broadbill		Other		
		#	weight	#	weight	#	weight	#	weight	species	#	weight

Form F2 – Trip report (catch)

RDA INTERNATIONAL – SMALL SCALE TUNA FISHING PROJECT – TONGA

MARKETING REPORT

Date of shipment ..../..../....

Destination market .....

More sheets for this shipment?			
Y/N		This sheet	..... of .....

Set #			Yellowfin			Bigeye			Albacore			Broadbill			Other			
Vsl.	Trip	Set	#	weight	$	#	weight	$	#	weight	$	#	weight	$	species	#	weight	$

Form F3 – Marketing shipment report