FARM MANAGEMENT AND MARKETING MANUAL

	TCP/SAM/3003(A) - Capacity Building in Agribusiness, Marketing of Agricultural Produce, and Farm Management for Young Farmer Groups in Samoa

Session 1

Keeping Farm Records

Trainer's Notes

Set the scene	A major obstacle to the use of farm management methods by smallholders in Samoa has been an absence of records on inputs used and their cost, and outputs obtained and the prices received for them. Encouragement of record-keeping can help to remove this obstacle.
Aim	Identify farm records required for modern farm management.
Expected outcome	Farmers are expected to be able to enter basic farm records, and understand the importance of these records and how they are to be used to make farm management decisions.
Duration of session	3 hours.
Method	Demonstrate the main forms needed and show how they are structured. Get trainees to form small groups and enter sample data that can be used in later sessions on budgeting. Arrange for these small groups to present and discuss their results in a large group session.
Outputs that participants should achieve	Plot history form. Form containing background information on an enterprise. Labour activity form. Input use form. Non-traded output and input price information form. Crops harvested and sold form. Cash book.
Concluding points to make	Farm records enable farmers to make better decisions, particularly when they are developing commercial activities. The number and complexity of the records depends on how commercialized the farmer is.
Additional reading	FAO (2004, pp. 117-123).

Lecture 1.1: Types of information requiring records

A farmer needs to gather more information on becoming more involved in commercial farming. The need to keep farm records increases as a result. There are seven types of forms that a farmer may use to help make farm management decisions.

A. Plot history form

Plot history forms are kept for each identifiable area of land owned by the farmer. They should contain information on area, soil quality, drainage, slope, erosion and other forms of degradation, fallow periods, crops grown and livestock grazed on the plot, and past incidence of pests and diseases.

B. Form containing background information on an enterprise

Each of this type of form contains background information on an enterprise of interest and use to the farmer. This information is updated for each production cycle.

New background information is needed for new crops. Three examples follow of background information on capsicum and eggplant. They are being considered by a farmer who, until now, has grown traditional crops mainly for household consumption.

a) What is the export status of the two new crops?

The green capsicum is not part of the traditional diet of Samoans but around one-third of its output is consumed by the farm household and the remainder sold as fresh produce, mostly supplied to Fugalei market. Capsicums used to be a significant export from Pacific islands to New Zealand prior to problems faced by exporters some 15 years ago caused by fruit fly found in a consignment of watermelons. A consignment was exported from Samoa to New Zealand in the 1970s (Department of Statistics/Ministry of Agriculture 1999, p. 12) but Samoa was not as active as some other countries in exporting vegetables to the New Zealand market. Eventually the export of capsicums to New Zealand from Pacific island countries was banned because capsicums are a potential fruit fly host. The introduction of high-temperature forced-air (HTFA) treatment of exported products at Atele has opened up the possibility of exporting capsicum to New Zealand.

Like capsicum, eggplant is not part of the traditional diet of Samoans but some produce is supplied to Fugalei market. Eggplant is also not a new export crop to Samoa, as some exports were included in the consignment to New Zealand in the 1970s, mentioned above. Eggplant has potential as an export crop following the introduction of HTFA treatment and the issue of an import health standard in August 2004 permitting entry into New Zealand.

The farmer would need to know the export status of these two products, how they should be presented for export and associated costs, and marketing procedures needed to secure an export contract. An appropriate HTFA treatment has been developed for eggplant, and treated produce has been successfully exported from Fiji for some time. However, there is not yet a satisfactory method for treating capsicum.

b) Greater use of purchased inputs

Eggplants require more purchased inputs than the traditional crops that the farmer is growing. The farmer would first need to know what these inputs are. Examples are fertilizers, insecticides and fungicides. He would also need to know how much to use, when and what the cost would be.

c) Prices of new outputs produced

What price is the farmer going to receive for capsicums and eggplants sold in the local market? Information is needed on local market prices for the crops and any marketing costs incurred in getting produce to the market. Alternatively, if the farmer expects to sell to a buyer who comes to the farm, the farm-gate price must be known. Both are seasonal crops and so the farmer would need to know how their prices are going to vary over the year.

Details on types of background information and for which enterprises are provided in Module 3.

C. Labour activity form

A labour activity form contains information on the amount of labour used and when, type of labour (hired or family, adult or child, male or female) and in which enterprise it is

used. Labour inputs would need to be split between the enterprises involved where they are used on a plot with intercropping or mixed cropping,. The information needs to be completed each time labour is used in an enterprise. The use made of this information is shown in Module 6.

D. Input use form

This form contains information on the use of inputs other than labour. It should contain information on how much of the input is used and when. This information needs to be recorded on the form each time an input is used. It is used when calculating gross margins in Module 4.

E. Non-traded output and input price information form

Information on prices of non-traded outputs and inputs should be completed at the end of each production cycle. The purpose of this form is to collect information to value inputs and outputs for which no price information is available. This information is also used to calculate gross margins in Module 4.

F. Crops harvested and sold form

This form contains two sets of information. The first set of information is on the type of crop harvested, the number of units and the average weight of each unit. The second set of information is on the number of units of the crop that are sold, their average weight and the price received per unit for the produce sold. Once again, this information is used to calculate gross margins in Module 4.

G. Cash book

A seventh farm record that is important for keeping track of cash balances is a cash book. This would contain some of the information collected on the forms listed above. However, it also enables the farmer to estimate all non-farm cash flows that need to be included in a cash flow budget. The preparation of this budget is the subject of Module 7.

Examples of entries for the various forms described above are shown in the exercise.

Lecture 1.2: Source of Information to Be Recorded

The farmer should be able to update the plot history information at the end of each year. A map of the farm is helpful in dividing the farm into plots. MAF personnel will be able to help the farmer assess soil quality and identify land problems such as erosion and pest and disease attacks that occur on each plot.

The farmer is also the most likely source of background information on enterprises, which is to be updated at the end of each year. The *Farm Management Manual for Western Samoa* (MAFFM 1991) used to provide the farmer with general information on enterprises that can be adapted to suit circumstances on the farm. MAF is currently in the process of updating the manual and can also provide updated market prices for products sold and costs of the main inputs used, supplemented by cash book entries. It is desirable that one family member takes responsibility for recording cash transactions on a regular basis. Typical sources for entries are bank accounts, receipts and invoices.

Individual family members can record on a regular basis the hours they work on different enterprise and the quantities of inputs they used. The farmer would normally be the person who keeps records on hired labour.

At the end of each production period, MAF personnel should be able to provide information on the range of prices of inputs and outputs that are not traded by the farmer.

Small Group Exercise 1.1: Keeping Records

This exercise requires trainees to enter a sample of different types of information on appropriate farm record forms. First, some background information is provided on crop production. The farm family consists of a farmer, his wife and a son aged 16. The family has produced taro, bananas and coconuts for a long time, and all family members know the production practices well for these enterprises. Few purchased inputs are used on these crops. The farmer has now decided to grow capsicum and eggplant that family members sell in the local market and, hopefully at some stage, in the export market.

During the year, the farmer produced 750 kg of capsicum from 0.3 acres, 1700 kg of eggplant from 0.2 acres, 2400 kg of first-ratoon bananas from 0.3 acres and 3200 kg of taro from 0.8 acres. All of the capsicum and eggplant, and 400 kg of bananas, were sold in the market. Coconut palms produce 500 nuts per year. All taro and coconuts were consumed in the household.

Labour activity form/Input use form

Examples follow of labour tasks and inputs used, to be entered on the appropriate farm record forms.

- On 5 June 2004, the farmer hired two casual labourers for 7 hours each to prepare half an acre for planting capsicum and eggplant. The hire rate was $3 per hour.[1] Eight hours are to be allocated to the capsicum enterprise and 6 hours to the eggplant enterprise.
- On 10 June, the farmer and his son took six hours between them to broadcast 75 kg of NPK 12:5:20 and 200 kg of chicken manure over the area to be planted to capsicum and eggplant. They lightly worked the fertilizer into the soil before planting. The chicken manure was not purchased but obtained from members of the aiga.
- On 17 June, the farmer and his son each spent six hours planting a 20-gram packet of capsicum seed on 0.2 acres.

[1] The dollar sign is used throughout this manual to designate Samoan Tala.

- On 18 June, the farmer and his son each spent three hours planting half a 20-gram packet of capsicum seed on 0.1 acres.
- On 19 June, the farmer and his son spent planted 50 grams of eggplant seed, taking five hours each.
- On 7 July, the farmer's wife spent 2 hours collecting mature coconuts.
- On 9 July, the farmer hired 5 hours of casual labour to harvest six bunches of bananas. The labourer was paid $15. The farmer's wife sold five bunches at the market on the next day, taking her six hours and costing $7 in marketing inputs.
- On 19 July, the farmer and his son applied 25 kg of urea along the rows of eggplant and capsicum, taking two hours each.
- On 5 September, the farmer's son spent two hours harvesting 50 kg of capsicum.
- On 18 September, the farmer's son spent an hour harvesting 60 kg of eggplant.
- On 26 September, the farmer spent an hour harvesting a basket of taro palagi.

Crops harvested and sold form

Examples follow of individual crops harvested and sold, to be entered on the appropriate farm record form:

- On 7 July, four baskets of mature nuts were harvested for household use. (Assume that one basket is equal to 15 kg and one nut is equal to 1.13 kg.)
- Five bunches of bananas were sold on 10 July for $1.00 per kg. One remaining bunch was kept for consumption in the household and by relatives. (Assume each bunch weighs 13 kg on average.)
- On 5 September, 50 kg of capsicum were harvested and sold for $3.60 per kg.
- An amount of 60 kg of eggplant was harvested and sold for $2.20 per kg on 18 September.
- One basket of taro palagi was harvested on 26 September for home use. (Assume that one basket weighs 15 kg.)

Non-traded input and output prices form

At year end, the following information on prices is to be recorded on the appropriate farm record form for examples of non-traded inputs used and outputs harvested:

- Taro palagi prices per basket averaged $16.50 during the year. They varied from $13.00 to $22.00 per basket.
- Mature nuts had an average price of $0.30 each during the year, varying from a low of $0.21 to a high of $0.47.
- Family labour was valued at $3.00 per hour throughout the year.
- Chicken manure was valued between $4.50 per 50 kg bag and $6.00 per 50 kg bag during the year. The average price was $5.00 per 50 kg bag.

Other cash transactions for entry in the cash book

Some cash book entries can already be made using the above information. They are the hiring of labour for harvesting bananas, and the sales of capsicum, eggplant and bananas. In addition, other entries are needed for the following cash transactions:

- The following purchases of household goods were made: 6 May $41.50; 3 June $54.20; 5 July $38.60; 9 August $31.30.
- 200 kg of NPK 12:5:20 were bought on 30 May for $340.
- On 8 June, purchases were made of two 20-gram packets of capsicum seed, costing $65 each, and two 25-gram packets of eggplant seed, costing $80 each.
- 100 kg of urea were bought on 10 July for $180.
- Remittances of $70 were received on 8 August.

Tasks

Enter the examples of cash transactions, labour activities, inputs, outputs, and input and output prices on the farm record forms.

Session 2

Preparing Background Information on Enterprises

Trainer's Notes

Set the scene	Emphasize that all farm management decisions depend on an accurate knowledge of the physical and technical conditions on the farm. They also depend on a good knowledge of the markets in which products are sold. Stress the continuing importance of family labour in agriculture in Samoa. This fact means it is very important to make best use possible of this resource by scheduling farm activities so there is a minimum of unused labour during the year and as few bottlenecks as possible during busy seasons that might disrupt production or require the farmer to spend cash on hired labour.
Aims	To enable farmer to have a thorough understanding of what they are capable of achieving with the resources they have, and to make sure that full and effective use is made of farm family labour.
Expected outcome	Farmers are expected to develop a good knowledge of what enterprise options they have available, and the different ways in which they can use their resources in these enterprises. Identification of periods of potential labour shortages and surpluses, and the need to employ casual hired labour to avoid bottlenecks in production.
Duration of session	4 hours.
Method	Material on the preparation of enterprise background information begins with an example of the yam enterprise. Trainees are then to form small groups and prepare background information on their own choice of enterprise, based on a checklist that is provided to them. Arrange for small groups to present and discuss their results in a large group session.
Outputs that participants should achieve	A set of enterprise background notes. Calculations of plot areas. Labour profiles (or schedules) by enterprise and for the whole farm. Recommendations on how to overcome labour deficits or surpluses.
Concluding points to make	Stress the fact that these background notes are necessarily general, and need to be adjusted for specific circumstances. The notes also need to be updated regularly. Labour scheduling need not involve only family members. It can be done for all types of labour – hired, family and communal. Indeed, it might be very helpful in planning the activities of communal labour

	tasks for youth groups.
Additional reading	FAO (2004, pp. 40-50). Dillon and Hardaker (1993, pp. 113-118). FAO (2004, pp. 63-65).

Lecture 2.1

Accurate technical information about how farmers operate their enterprises is the basis for any form of financial analysis in farm management. This information tells you how inputs are used in the farming system to produce outputs. Details are also provided on the costs of the inputs and values of the outputs.

The technical and financial information needed to make commercial farm decisions takes many different forms. The best way to demonstrate this is to use an example, and to have some practice at completing forms for different enterprises in Samoa.

Checklists for background information follow for crop and livestock enterprises. They do not cover every piece of information that might be needed.

Checklist for Background Information on a Crop Enterprise

1. Types/varieties

2. Production notes

Climatic suitability
Soil suitability
Fertilizer requirements
Propagation
Planting times
Planting methods
Planting density
Intercropping
Growth period
Disease and pest control
Weeding
Harvesting methods
Storage
Yields

3. Marketing notes

Marketing outlets

Transport needs

Packaging needs

Prices and price variability

Lecture 2.2: Checklist for Livestock Enterprise Background Information

1. Reproduction

Breeds

Selection of breeding stock

Breeding/mating:

- Weight of breeding stock at puberty
- Age of breeding stock at puberty
- Oestrus cycle
- Heat period
- Gestation period
- Breeding interval
- Offspring per breeding cycle
- Birth weight of offspring
- Mortality rate
- Offspring weaned per breeding cycle
- Offspring weaned per breeding stock per year
- Average breeding life
- Replacement rate of breeding stock

2. Growth

Age at weaning

Weight at weaning

Proportion sold as weaners

Non-livestock products sold

Sale weight

Age at sale

Post-weaning mortality rate

Weight of cull breeding stock

3. Feeding

Feeding requirements

Feed quality

Feed mix

Rations

Feed costs

Feed supply

4. Management

Management skills needed

Pasture management

Housing

Water supply

Hygiene

Special requirements during pregnancy

Disease and parasite control

5. Processing and Marketing

Slaughtering needs

Market outlets

Transport needs

Packaging needs

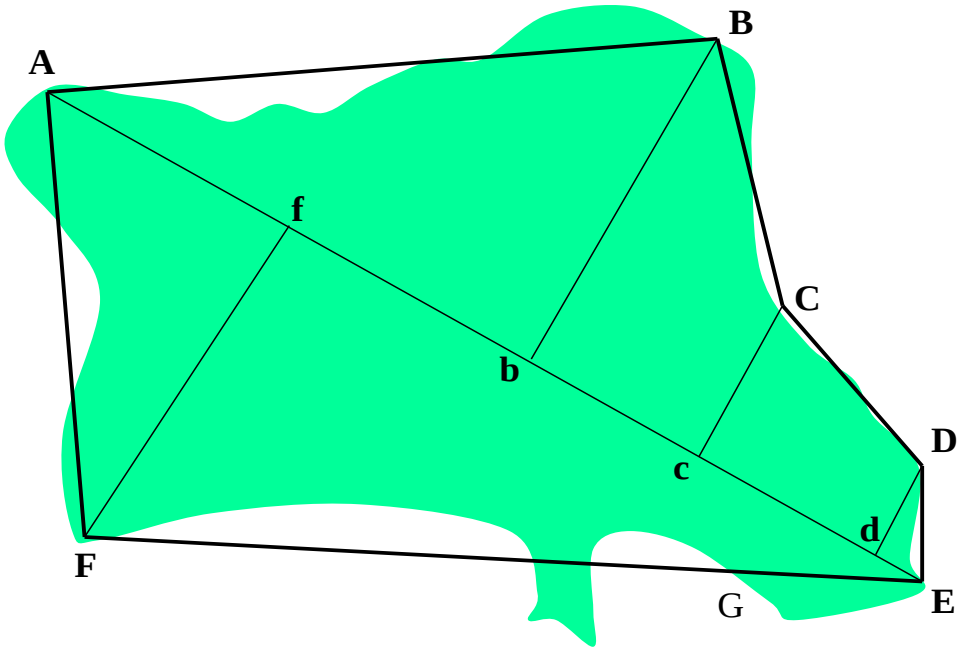
Lecture 2.3: Measuring Plot Area and Yield

Two important pieces of technical information for farmers to collect are areas of plots and yields per plot and per acre. Details are provided below on how to calculate these pieces of information.

Measuring plot area

Consider the following example of an irregularly shaped plot of land, shown in Figure 3.1. There are six areas to be measured: triangle Abb; trapezium BCcb; trapezium CDdc; triangle Ded; triangle AfF; and triangle FfE. Present trainees with the following map of a plot of land.

Figure 3.1 Plot of Land to Be Measured



They should measure the area using trapeziums and right-angle triangles.

Triangle Abb = (Ab/2)*(Bb)

Trapezium BCcb = (bc/2)*(Bb+Cc)

Trapezium CDdc = (cd/2)*(Cc+Dd)

Triangle Ded = (dE/2)*(Dd)

Triangle AfF = (Af/2)*(Ff)

Triangle FfE = (fE/2)*(Ff).

Small Group Exercise 2.1: Preparation of Background Information for an Enterprise

The aim of the exercise on preparing background information for enterprises is to enable trainees to understand what information they should collect in order to make good decisions when managing the operations of that enterprise. Arrange trainees into small groups and ask them to select a farm enterprise. They are to provide background information on their selected enterprise.

Separate checklists are provided above for background information on crop and livestock enterprises. Depending on the nature of the enterprise, additional headings might need to be added to the checklist and some of those included might be ignored. No model answer is provided for this exercise. Trainers can refer to MAFFM (1991) for background information on the enterprises that trainees choose. But remember that this publication is dated and was largely based on Tongan farming systems in the first place. A better source is the set of budgets on 33 enterprises recently prepared by the Policy and Planning Division of MAF. Market information can be obtained from the publications of the Market Information Service, also prepared by the Policy and Planning Division of MAF.

Lecture 2.4: Scheduling Labor Activities

The scheduling of labour among enterprises is important for smallholders wishing to increase their profits because labour, especially family labour, is one of the two most important resources available to the farmer (the other being the land itself). For effective labour scheduling, it helps to prepare a labour profile. A labour profile shows the seasonal labour requirements of each enterprise and of the farm as a whole.

The time interval chosen for scheduling labour can vary from days to years. A month or a quarter is sufficient for most purposes, but a year may be appropriate for a crop or livestock enterprise with a production cycle spanning many years. Labour requirements and availability are usually measured in hours or days. In Samoa a reasonable working day for a farmer is about five hours. Days were used in the gross margin analyses and partial budgeting but hours are used in the exercises in this module. An advantage of using hours is that it avoids the problem that not all people work the same number of hours in a day. Monthly profiles of hours of labour required and available are used in the example and two exercises that follow.

There are five steps to follow to construct a labour profile:

1. Calculate the total number of hours or days required to conduct each enterprise.
2. Divide the total number of hours/days required for each enterprise into monthly or quarterly intervals.
3. Calculate the total number of hours/days required by all enterprises in each month/quarter.
4. Calculate the number of hours/days that household members are available during each month/quarter.
5. Subtract the required number of hours from the number of hours of available labour. For any month/quarter, there is a labour surplus if the figure is positive and a labour deficit if the figure is negative.

Example: Cocoa-Based Mixed Cropping Farm

A smallholder grows 3.18 acres of cocoa trees, mainly for *koko Samoa*. The trees are now in their ninth year. She plans to grow 1 acre of yams, to be planted in June and July, and half an acre of pineapples, to be planted in March. There are 2 acres in fallow. Labour requirements for each enterprise are shown in hours on a monthly basis in the third to fifth columns of the labour profile presented in Table 6.1.

Table 2.1 Labour Profile for a Cocoa-Based Mixed Cropping Farm

Month	Labour requirement (hours)			Surplus (Deficit) in hours		
	Cocoa	Yam	Pineapple	Required	Available	Balance
January	20	15	10	45	50	5
February	20	15	10	45	150	105
March	15	10	45	70	200	130
April	14	10	10	34	150	116
May	10	10	10	30	140	110
June	14	145	10	169	90	-79
July	10	140	10	160	80	-80
August	14	55	10	79	120	41
September	20	45	10	75	150	75
October	54	35	10	99	150	51
November	55	15	10	80	150	70
December	24	15	10	49	30	-19
Total	270	510	155	935	1420	485

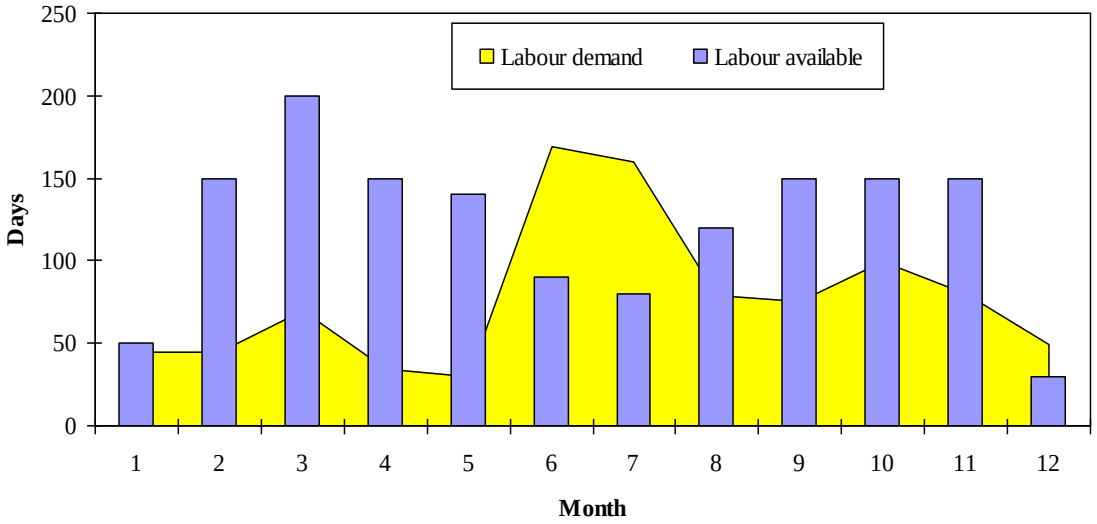
A guide to labour requirements and their distribution across months can be obtained from experienced farmers, and MAF staff and publications. For example, MAFFM (1999, p. 10) estimated a labour requirement of 42 days for one hectare of nine-year-old cocoa

grown using normal smallholder methods. Assuming a five-hour working day, approximately 270 hours of labour would be needed for 3.18 acres.

The total monthly labour requirement is shown in the sixth column. Total labour availability is shown in the second last column and the balance between labour requirement and availability is shown as a surplus (+) or deficit (-) in the final column.

Figure 6.1 shows the total labour demanded per month and the amount of labour available. This graph clearly shows the labour deficits in the months of June, July and December (the shaded cells in the last column of Table 6.1). There is surplus labour in the other nine months of the year.

Figure 6.1 Labour demand and supply in a cocoa-based farming system



The main deficits are in June and July when there is a heavy labour demand for planting yam and when yam harvesting is planned to start. Labour availability in these months is limited by the need by family members to attend to matters off the farm. There is also a small deficit in December when, once again, family members have off-farm responsibilities that reduce the amount of time they can devote to farming.

There are four ways for the farmer to deal with the labour shortages. A partial solution to the labour shortage of 159 hours over the two months, June and July, is to move the

planting of yam forward to May when there are 110 hours surplus. Second, harvesting could begin earlier than the planned 12 months from planting as it is possible to begin harvesting early yam 9 months after planting. A third solution is to see if it is possible to rearrange the labour activity schedule for the other two crops of cocoa and pineapple. The farmer would need to check how much scope there is to do this depending on whether labour demands in the deficit months for these two crops are flexible. A final option is to increase labour availability in the months of labour shortage by calling on other family members to provide labour or to engage in communal labour tasks in other months and call upon group members who have spare time during June and July.

Note that there is a lot of surplus labour in February, March, April and May. If labour is obtained to cover the shortfalls in June and July, it might be possible to plant extra crops on the fallow land from February to May providing the enterprises require only small amounts of labour in the period from June to August and in December. Unfortunately, the planting time for most vegetables in Samoa is from June to October. But other crops can be planted year-round or are best planted during periods that overlap with the time that surplus labour is available. For example, the recommended planting period is from January to April for kava, year-round but best around October for bananas (MAFFM 1997, p. 9), and year-round (MAFFM 1991, p. 62) but best from March to July for giant taro.

Small Group Exercise 2.2: Scheduling Labour

Exercise 1: Case study mixed cropping farm with banana, tomato and root crops

A farmer is producing five crops on 8 acres of land: taro (*taro Samoa*); giant taro (*taamu*); banana (fa'i); and tomatoes. You are provided with the following information on labour availability in the farm household and the labour requirements of each enterprise.

Labour availability

The amount of family labour available in hours each month is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
180	230	230	230	230	190	220	230	200	160	220	160

Labour requirements

An area of 2 acres will be left fallow over the next year, and will be grazed by a few animals. Tending the animals is expected to require 5 hours of labour every month. There will be some general farming demands on the farmer's time, as follows (in hours):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10	10	60	40	20	10	10	10	10	50	15	10

Five crops are to be grown during the year. One acre of taro will be planted in August. It will require 55 hours of labour in August, 50 hours in September and 85 hours in October.

Half an acre of banana is to be planted in March while 1.5 acres have been planted in the past. Of these 1.5 acres, one acre is in its fourth ratoon, and half an acre is in its fifth ratoon. Total labour requirements in hours for the 2 acres are as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
110	110	155	65	80	80	70	55	70	80	110	110

The preparation of giant taro suckers is to begin for planting half an acre in March and April. Harvesting is to take place from September for 0.75 acre planted in the previous year. The schedule for labour requirements in hours is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
20	20	40	80	60	60	40	16	40	40	30	20

One-quarter of an acre is to be allotted to tomato plants in July, and the tomatoes are to be harvested in October. The labour requirements are 31 hours in July, 30 hours each in August and September, and 80 hours in October.

A second crop of taro is to be planted in November on 0.5 acres of the land that was planted to giant taro earlier in the year. There is also 0.5 acres already in the ground at the start of the year that will be harvested towards the end of the year. The schedule for labour requirements in hours is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
15	10	10	8	6	4	4	5	6	10	40	42

Tasks

1. Prepare a labour profile for the year.
2. Identify the main periods of labour surplus and labour shortage.
3. Describe how the farmer can make better use of family labour, assuming it is impossible to get family members to work any more hours or to get any hired labour in December.

Session 3

Calculating Enterprise Gross Margins

Trainer's Notes

Set the scene	Farm profit usually features strongly in the goals of most small farmers. The first step in deciding how to get the best profit from farm resources is to determine which enterprises provide the highest gross margin per unit of a resource.
Aim	To find out how profitable each farm enterprise is.
Expected outcome	The farmer is able to determine whether a particular farm enterprise is profitable, and how well it ranks compared with other enterprises.
Duration of session	3 hours.
Method	Gross margin planning and sensitivity analysis. Begin with the mini lecture and the example using the banana enterprise, to be followed by small group exercises. Ten exercises are included, covering a range of enterprises that are common in Samoa. Allocate an enterprise to each group. Arrange for small groups to present and discuss their results in a large group session.
Outputs that participants should achieve	Estimates of gross margins for potential enterprises that the farmer can use when deciding on which enterprises are the most profitable. These gross margins may be expressed per acre, per day or hour of labour, per dollar of capital, per dollar of working capital or per dollar of fixed capital. Gross margin per day of labour is considered to be the most important calculation to be made.
Concluding points to make	Gross margins are an essential 'building block' in preparing a farm plan. Recognize the uncertainty associated with the gross margin estimate. Yields and output prices are particularly volatile.
Additional reading	MAFFM (1991) and MAF gross margin budgets. Dillon and Hardaker (1993, pp. 159-162). FAO (2004, pp. 50-57, 62-63).

Lecture 3.1

Definitions

The *gross margin* of a farm enterprise is the gross income from output produced minus the cost of variable inputs used to produce that output.

The *gross income* of an enterprise is the value of all outputs produced in that enterprise. For each output, it is calculated as the farm-gate price of the output multiplied by the quantity produced. Valuing output can cause problems in situations where the price paid to the farmer is not available. However, a local market price or export price may be available. In these cases, marketing costs must be calculated and deducted to obtain a farm-gate price. The form of the output for which there is an available price might be different from that which the farmer sells. In the broiler enterprise, price is quoted in dressed weight while the output is measured before dressing takes place. In addition, not all quantities are recorded in the same units. They may be in kilograms, bags or baskets, for example. It is important to have a means of converting all quantities to a common unit, usually kilograms or tonnes. The Fugalei market statistics produced by the Statistical Services Division in the Ministry of Finance provide average weights in pounds and prices in tala per pound.

Variable costs are the sum of costs of inputs that vary with the level of production in the enterprise. Each variable cost is calculated by multiplying the price the farmer pays for the input by the quantity of the input used in the enterprise. Some common examples are seed and other planting materials, feed, veterinary supplies, fertilizers, chemicals and biological agents to control pests, diseases and weeds, packing material, transport and hired casual labour.

A *fixed cost* is estimated by multiplying the quantity of the fixed input by the price paid for it. Examples of fixed inputs are rents, licences and costs associated with the upkeep of fixed assets such as buildings, plant and machinery. A fixed input is distinguished from a variable input in that it does not vary with the level of production of the enterprise. Repairs to machinery are a fixed cost but machinery hire is a variable cost because the amount of time a machine is hired varies with the level of production.

The treatment of *family labour* is difficult when deciding on variable and fixed costs. It depends on how easy it is for family members to switch from farming to other activities from one day to the next. In most cases, family labour inputs are best treated as fixed inputs and their costs excluded from the calculation of a gross margin even though they can be varied to some extent, according to access to alternative income-earning possibilities. Ask trainees to calculate gross margin per hour of family labour used, considering family labour as a fixed cost. The solutions to the exercises also contain estimates of the value of family labour inputs, with gross margins calculated after subtracting this value from gross income in addition to other variable costs. A gross margin calculated in this way would be used when it is assumed family labour is a variable input.

Stress to the trainees that there is always some uncertainty about the accuracy of the information used in estimating a gross margin because we are dealing with future events. Therefore, it is always wise to do some sensitivity analysis. This means we calculate how much a gross margin changes when there is a change in the values used to calculate it.

Lecture 3.2: Which enterprises to choose for calculating gross margins?

Most farmers in Samoa have many enterprises to choose from to include in their farm plan. It would take a lot of work to calculate gross margins for all of them. The *Farm Management Manual* produced by MAFFM (1991) covers the important crop and livestock enterprises in Samoa and the gross margin budgets presented in the manual can provide a guide. As mentioned before, however, this publication is dated and was largely based on Tongan agriculture. More recent budgets have been prepared by MAF, and should be used where possible. However, these budgets need further work on the yield estimations, which may be different from those obtained by the farmer.

Farmers should concentrate on calculating gross margins for those enterprises that best suit their resources and circumstances. They should only use the estimates in the manual as a starting point.

Lecture 3.3: Steps in gross margin planning

Explain to trainees that the main purpose of gross margins is to compare the profitability of different enterprises to get the best profit from the resources available. This assumes all enterprises use fixed inputs to about the same degree. Gross margins have to be expressed in a consistent way for all enterprises. It is usual to express them for one acre per year, as done below.

However, there is no rule on which resource should be used as the basis for getting the highest gross margin. It depends on what the farmer thinks is the most limiting resource. In some cases, a comparison of gross margins per acre might not be appropriate. An intensive broiler enterprise, for example, might use little land but be a heavy user of capital. In this situation, it would be wise to compare gross margins per dollar invested in the enterprise. Then again, gross margins per unit of various resources can all be used, leaving the farmer to make a choice between the different measures. In all cases, it is good practice to calculate gross margin per labour unit (hour or day, for example) because labour is an important input in all enterprises in Samoa.

There is also a problem of different lengths of the production cycle of enterprises. In the exercises that follow in which gross margins are calculated for one acre of land, different crops are in the ground for different lengths of time and so the gross margins for the crops cannot be directly compared. In Module 8, trainees get experience in compiling a farm plan consisting of a number of enterprises with different production periods. At this stage, they will simply calculate gross margins per acre for the length of the production cycle of each enterprise.

Assuming one acre of land, which is the most limiting resource, the method of gross margin planning follows six steps:

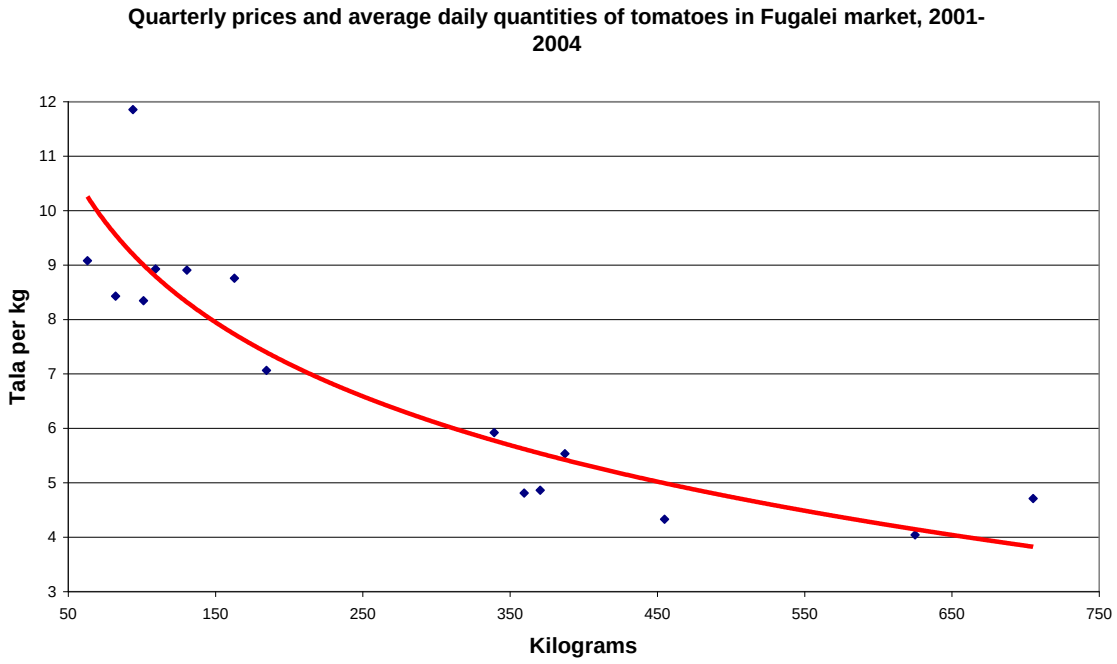
1. Prepare the background information on enterprises that potentially could be grown on the farm (discussed in Module 3).
2. Prepare an inventory of available resources on the farm that can be used in production of the enterprises identified in Step 1.
3. Obtain data on input and output quantities and prices for each enterprise.

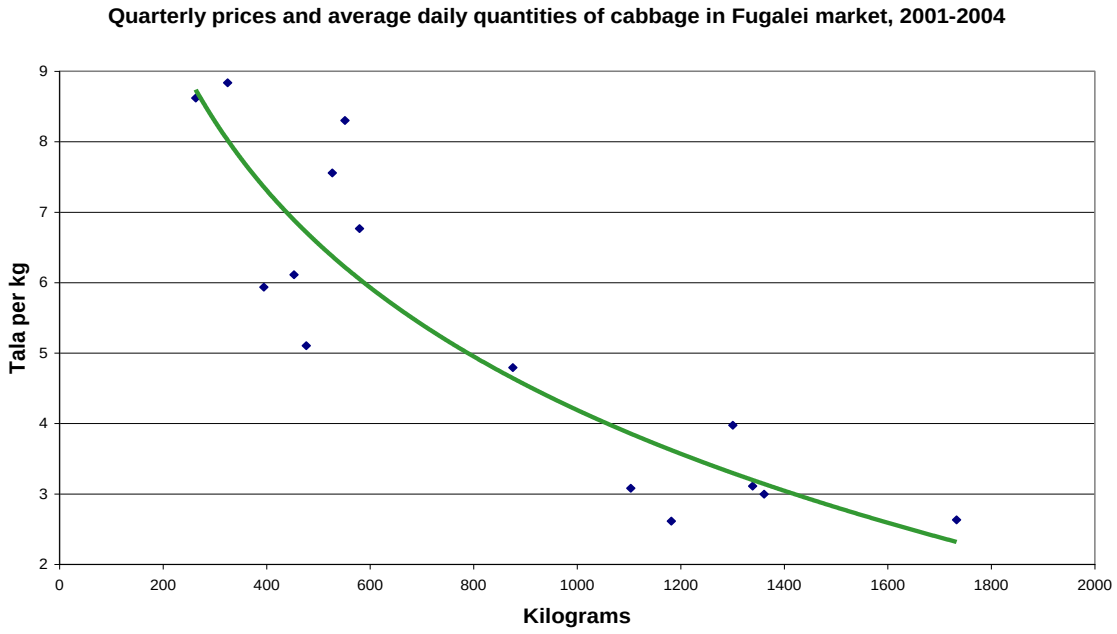
4. Calculate gross income from the enterprise for one acre.
5. Identify and calculate the costs of variable inputs used to produce the output from one acre.
6. Subtract variable costs from gross income to obtain gross margin per acre.

Lecture 3.4: Sensitivity analysis

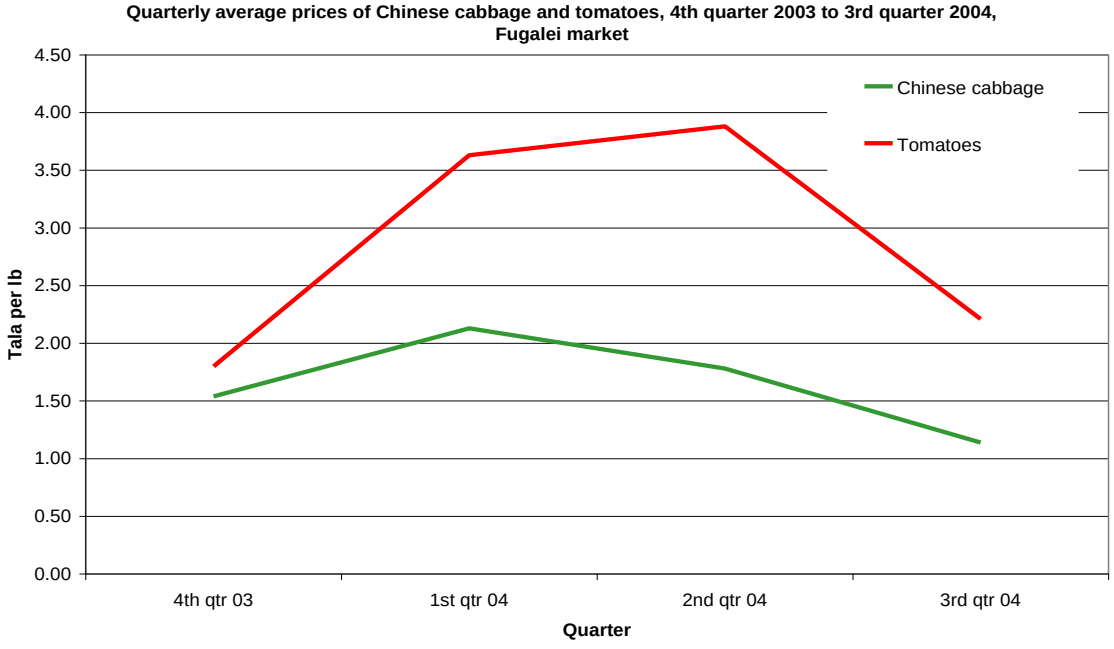
Sensitivity analysis is a final step that is usually undertaken in gross margin analysis. The aim is to test how much the gross margin estimate changes with changes in important elements that make up the gross margin. The two most important elements are usually price per unit of output and yield. Price and yield can vary substantially over time and between farms. Prices of most seasonal crops sold in Fugalei market vary within a year.

Consider the example of tomatoes and Chinese cabbage in the following graphs, where the red and green lines are lines of best fit. When the market volume is high, price is low, and when market volume is low, price is high.





As shown on the next graph, the average price of tomatoes in the second quarter of 2004 ($3.88) was more than double the average price in the fourth quarter of 2003 ($1.80). The average price of Chinese cabbage in the first quarter of 2004 ($2.13) was slightly less than double the average price in the third quarter of 2004 ($1.14). Clearly, it could make a big difference to the gross margin estimate if tomatoes and Chinese cabbage were to be sold at different times of the year.



Similarly, yields vary a lot depending on growing conditions from one season to the next and one year to the next. They can also vary from one district to another or between farms in the same district, or depending on which variety is planted. In addition to prices and yields, there may be other variables you would wish to vary to test for the sensitivity of gross margin to their values.

Gross Margin Example 3.1: Banana Enterprise

This example is based on the gross margin analysis for banana prepared by the Policy and Planning Division of MAF. Some differences exist because of changes in prices since the budget was prepared.

While a banana plant remains in the ground for a few ratoons, we will ignore the ratoons and calculate the gross margin for the first year only. Calculation is based on one acre. Assume that all output is sold in Fugalei market.

Output is estimated to be 18,000 lbs per acre and the price received by the farmer is forecast to be 52.5 sene per pound. Because the price is in pounds, you must put output in the same units (18,000 lbs). Therefore, gross income is calculated as 18,000 lbs multiplied by $0.525, which equals $9,450. As there is only one output in this enterprise, the value of $9,450 is also gross income.

There are seven variable inputs used in the production of the bananas in their first year:

- Application of 1 litre of the herbicide, Roundup 36% EC, which costs $193 per 5-litre container (used to prepare the land for planting)
- 680 suckers used as planting material, costing $0.50 each
- 415 kg of the fertilizer, NPK 12:5:20, costing $1.70 per kg
- Application of the fungicide, Tilt, at a rate of 2 litres of per acre, costing $250 per litre
- Application of misting oil at a rate of 60 litres of per acre, costing $13 per litre
- Application of two litres of the insecticide, Tridex, at a cost of $42.40 per litre

- Marketing cost of $20 per trip to the market, consisting of $5 to hire a market stall and $15 for transport. Seven trips are made to the market to sell the bananas.

The price is multiplied by the quantity in each case to calculate the variable costs.

The following details are provided on family labour inputs per acre. Four days are spent preparing the land and planting the suckers, 3 days applying the fungicide and insecticide, 2 days weeding, 2 days applying fertilizers, 3 days desuckering, deleafing and propping, 7 days harvesting and 7 days marketing.

The gross margin for one acre of bananas is shown below.

Description	Units	Quantity	Price per unit	$
Bananas sold	Pounds	18000	0.525	9450.00
Gross income (A)				9450.00
Variable inputs				
Herbicide	Litres	1	38.60	38.60
Planting material	Suckers	680	0.50	340.00
NPK 12:5:20 fertilizer	Kilograms	415	1.70	705.50
Fungicide	Litres	2	250.00	500.00
Misting oil	Litres	60	13.00	780.00
Insecticide	Litres	2	42.40	84.80
Marketing	Days	7	20.00	140.00
			Total variable costs (B)	2588.90
			Gross margin per acre (A-B)	6861.10
			Gross margin per day of family labour (28 days)	245.04
			Gross margin per $ of variable costs	2.65

The gross margin per acre, per day of family labour and per tala of variable costs is much lower in the first year of banana production than for the whole production period. For

example, the gross margin per day of family labour for the whole production period of almost five years is $402.89. More labour is needed to establish and operate the banana plantation in the first year (28 days) than is needed to operate the plantation in following years (15 days on average).

Results are presented below for a sensitivity analysis in which price and yield are both halved and increased by 50 per cent. It can be seen that halving both yield and price would result in a loss for the enterprise.

Price ($/lb)	Yield (lb)		
	9000	18000	27000
0.263	-226	2136	4499
0.525	2136	6861	11586
0.788	4499	11586	18674

For the first year of production, the break-even yield is calculated to be 4930 lb while break-even price is estimated at $0.14 per lb. For all years of production, the break-even yield is 3168 lb and the break-even price is $0.09 per lb. It is concluded that the banana enterprise is profitable except under very poor production and market conditions.

Small Group Exercise: Calculating Gross Margins

Seven enterprises have been chosen for calculating gross margins. Allocate one enterprise to each group. The groups are to calculate the gross margin for the enterprise assigned to them, using the information provided.

Task 1 Identifying variable inputs

Before they begin to calculate gross margins, each group is to suggest which variable inputs they would include for the enterprise that they have been assigned. There is no single correct answer for this task because farmers may apply different inputs according to their different situations. For example, a farmer on very fertile soils might apply no fertilizer whereas a farmer on poor soils may need to apply several fertilizers for the same crop enterprise.

Task 2 Calculating gross margins

Trainees are to begin by calculating gross income. Gross income is the sum of revenues obtained from all outputs in the enterprise. There will usually be only one but, in some cases, there might be more than one. For example, in the final exercise, intensive broiler, poultry manure is sold as well as the broilers themselves.

Explain that gross revenue is calculated by multiplying the price per unit of output by the quantity produced. As mentioned in Module 2, *all outputs should be valued regardless of their final destination*. Trainees should value unsold output at the same price that is used for output that is sold.

Ask trainees how they would decide which values to vary when undertaking a sensitivity analysis. Two things should influence their choice. First, ask them to think about which factors are most critical to their profit. The most common examples are output prices and yields, and these are the variables that tend to get used in the exercises. Other possibilities are prices of important inputs. Second, choose those factors whose values vary a lot and are uncertain. Again, yields and prices of the main output are often difficult to forecast. On the other hand, you usually have a better idea of the prices and quantities of farm inputs used.

Calculations

Each group is to perform the following calculations, except for the three livestock enterprises:

- Total gross margin per acre for the production period.
- Gross margin per dollar of variable cost.
- Gross margin per hour of family labour.

An additional calculation for groups that select the kava enterprise is the gross margin in each year.

Groups choosing the two semi-intensive livestock enterprises are to calculate the total gross margin for the year, gross margin per animal sold and gross margin per dollar of fixed capital. Groups choosing the intensive broiler enterprise are to calculate the total gross margin for the production period, gross margin per animal sold and gross margin per dollar of fixed capital.

Check that all groups have managed to estimate gross income successfully before continuing to calculate variable costs.

Enterprise 1 Taro Samoa (TLB-Resistant)

This exercise is based on technical and financial information used in the gross margin analysis for taro prepared by the Policy and Planning Division of MAF in 2004. Some differences exist because of changes in prices since the analysis was undertaken.

Outputs

The output of taro on an acre of land is estimated to be 7500 lbs of corms and 500 bundles of leaves. 3000 lbs of the corms are to be retained for consumption by the household and 4500 lbs are to be sold in Fugalei market. All leaves are used for household consumption. The farmer expects to receive $0.96 per pound of corms sold in the market. A bundle of leaves sells for $4.00 in the market.

Variable inputs

Production inputs

The farmer uses 4000 suckers for planting. Each sucker is valued at $0.50.

No fertilizer is applied.

The farmer applies two litres of the insecticide, Tridex, at a cost of $42.40 per litre.

Five litres of Sting are applied to control weeds. The cost is $24.00 per litre.

Family labour is valued at the minimum wage of $16.00 per day. It is used for all production and marketing tasks. Land preparation takes 1 day; planting takes 9 days; weeding takes 31 days; and harvesting takes 16 days.

Marketing inputs

It is estimated that 1500 lbs of taro can be sold for each trip to sell taro in the market. Family labour is used for all marketing tasks. Packing takes 1 day in total and it takes 1 day to sell 1500 lbs of taro in the market. For each trip to the market, the hire of a stall costs $5 and transport costs are $15 per trip.

Enterprise 2 Papaya

This exercise is based on technical and financial information used in the gross margin analysis for papaya prepared by the Fruit Tree Development Project (MAFFM 2001, p. 35). Some differences exist because of changes in input prices since the analysis was undertaken.

Outputs

A local variety of papaya was planted on one-half a hectare of land and is now in its third year of a five-year production cycle. There are 900 trees of which 600 are bearing. Marketable yield per bearing tree is 23 kg. None is to be retained for consumption by the household. Twelve tonnes are to be sold for export to New Zealand and the remaining fruit is to be sold in Fugalei market. Exported fruit is collected at the farm gate for a price of $1.00 per kg, with the exporter meeting all HTFA and transport costs. The farmer expects to sell papaya destined for Fugalei market at $0.50 per kg.

Variable inputs

Production inputs

The farmer uses 900 papaya seedlings, costing 40 sene each.

Two fertilizer applications are recommended. First, the farmer applies 80 grams of NPK 12:5:20 per bearing tree per month, at a cost of $1.70 per kg. Second, 450 grams of triple superphosphate are applied to each of 300 seedling holes at a cost of $2.35 per kg.

The farmer has to buy harvesting equipment for use this year and the following two years. The total cost of the equipment (ladder, harvesting stick and field bins) over the four years of harvesting is $4260 of which one-quarter is to be allocated as a cost in this year.

The following details are provided on family labour requirements. Clearing takes 12 days; cutting, lining and digging holes takes 12 days; planting takes 3 days; weeding takes 30 days; fertilizing takes 21 days; pest control and sanitation takes 5 days; harvesting takes 39 days; and grading and packing takes 20 days.

Marketing inputs

Two trips are made to sell papaya in Fugalei market. Each trip costs $20 in transport and stall hire costs.

Session 4

Cash-Flow Budgeting

Trainer's Notes

Set the scene	Start the session by describing how greater participation in commercial agriculture means farmers have to pay more attention to cash flows. Preparing cash flow budgets is also important for going to the bank to ask for a loan to finance farming operations. This means keeping track of how much cash is available for farming and other activities from one period to the next.
Aim	Identify possible future cash deficits and surpluses.
Expected outcome	Farmers should know how to calculate their net cash flow position for any period in which they are interested, and be able to present a cash flow budget when applying for a loan.
Duration of session	3 hours.
Method	Start by identifying the different components of a cash flow budget, outlined in the mini lecture. The cash transactions reported in Module 2 are then entered in an exercise. Trainees are to prepare one of four cash flow budgets. The first exercise involves the preparation of an annual farm plan for which quarterly cash flows are calculated. In the second exercise, the farmer is building a semi-intensive broiler operation and is preparing an annual cash flow budget on a monthly basis. In the third exercise, a rambutan plantation is developed for which time intervals are in years. The final budget is for a long-term piggery development, which is also in yearly intervals over a decade. Arrange for small groups to present and discuss their results in a large group session.
Outputs that participants should achieve	A detailed cash book, with summaries of cash receipts and payments for each period.
Concluding points to make	The length of the selected time interval depends on the purpose of the budget. Cash flow budgets are an integral part of development budgets used for making major changes to the farm plan.
Additional reading	Dillon and Hardaker (1993, pp. 82-84). FAO (2004, pp. 65-68).

Lecture 4.1

Cash flow analysis is important in farm management for two main reasons:

- It provides information on income and expenditure that can be used to assess how profitable a farm has been (or is expected to be) in a given period.
- It enables sound management of the financial side of the farm business, ensuring that the farmer has sufficient liquidity to meet his or her obligations.

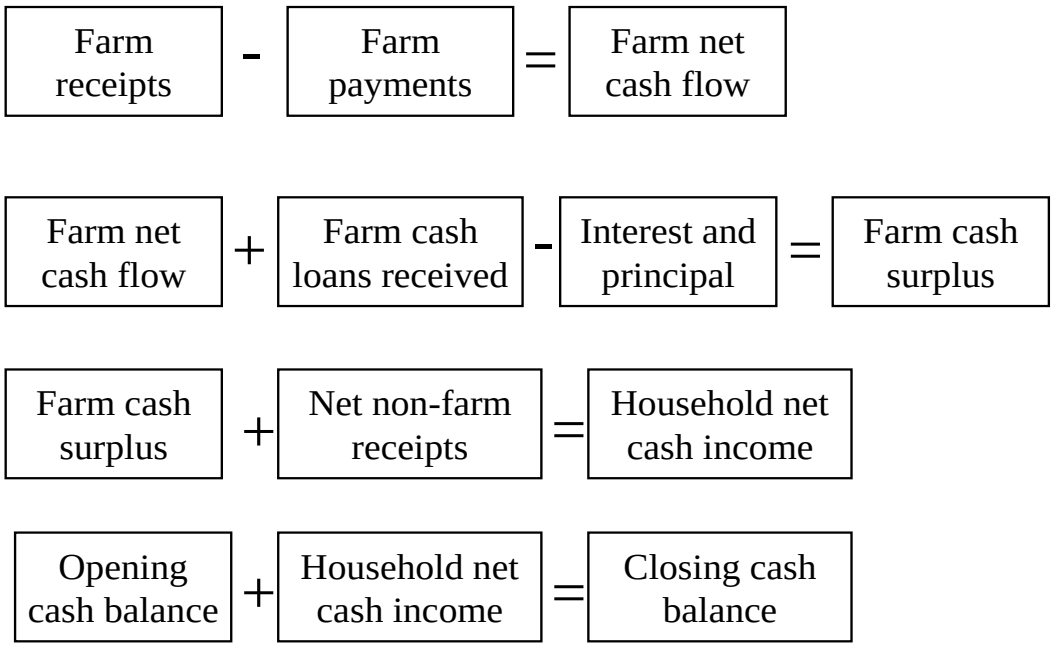
The concept of cash flow is best described through various cash flow measures, represented in four rows in Figure 7.1. The first row shows how to derive the *net cash flow* of the farm as the total receipts from farming operations minus the total payments made to undertake these operations. This equation can be expressed for different periods, from a week to many years. The choice of period depends on what information the farmer wants from the analysis. A farm plan for the next year might need a cash flow budget with quarterly intervals. Annual intervals are likely to be used to plan the introduction of a new long-term enterprise, such as a tree crop or intensive livestock enterprise.

Where a farmer has borrowed money to conduct these farming operations, details are needed on how much has been borrowed during the period of analysis and how much has been paid to the lender in interest and principal repaid. These transactions are shown in the second row. The result is called *farm cash surplus*.

The net receipts from other (non-farm) household cash transactions are added to the farm cash surplus to obtain household net cash income. We include household receipts and payments in addition to farm cash flows in the third row of the diagram to reflect the fact that the household and the farm business are usually highly integrated in Samoa.

The household net cash income is added to the opening cash balance for the period to calculate the closing cash balance for that period. This is shown in the final row of Figure 7.1.

Figure 7.1 Cash-Flow Measures



Source: Adapted from Dillon and Hardaker (1993, p. 83).

Example: Preparing a Cash-Flow Budget

Consider the following cash transactions reported in Module 2, and assume that the opening balance on 1 May is $560. Prepare a monthly cash flow profile from May to September:

- Household goods are purchased as follows (rounded to whole dollars for convenience): 6 May $42; 3 June $54; 5 July $39; 9 August $31.
- 200 kg of NPK 12:5:20 are bought on 30 May for T1.70 per kg.
- Two 20-gram packets of capsicum seed are purchased on 8 June for $65.
- Two 25-gram packets of eggplant seed are purchased on 8 June for $65.
- 100 kg of urea are bought on 10 July for $0.90 per kg.
- Remittances of $70 were received on 8 August.
- On 5 June 2003, the farmer hired casual labour costing $40.
- On 9 July, the farmer hired 1 hour of casual labour to harvest 83 kg of bananas. The labourer was paid $5. The farmer's wife sold 5 bunches at $7.80 per bunch on the next day, incurring marketing costs of $7.
- On 5 September, 50 kg of capsicum were harvested and sold for $2.30 per kg.
- An amount of 60 kg of eggplant was sold on 18 September for $1.80 per kg.

Begin by entering the opening balance of $560 at the top of the column for May. There are no farm receipts for May but there are NPK 12:5:20 fertilizer costs of $340 (200 kg at $1.70 per kg). This figure is entered in the May column of the fertilizer row. The only other cash transaction in May is for living expenses of $42. This amount is entered in the May column and living expenses row.

It is now possible to calculate the rows for the various totals for May. Total farm receipts are zero; total farm payments are $200; and net farm receipts are therefore -$200 ($0 minus $200). Total non-farm receipts are zero; total non-farm payments are $42; and therefore net non-farm receipts are –$42 ($0 minus $42). The closing cash balance is the sum of the opening cash balance ($560), the net farm receipts (-$200) and the net non-

farm receipts (-$42), which equals $318. Household net cash income is the sum of net farm receipts (-$200) and net non-farm receipts (-$42), which equals –$242.

The same procedure is followed for the next four months, with the closing cash balance of $318 from May carried forward as the opening cash balance in June. Note that a cash deficit occurs from June to August, signalling to the farmer that action has to be taken to make changes to the farm business or obtain a loan in order to avoid this situation occurring.

Table 4.1 Monthly Cash Flow Budget from May to September

Month	May	June	July	August	September
OPENING CASH BALANCE	**560**	**318**	**-36**	**-138**	**-99**
Farm receipts					
Sales of bananas	0	0	39	0	0
Sales of capsicum	0	0	0	0	115
Sales of eggplant	0	0	0	0	108
Total farm receipts	**0**	**0**	**39**	**0**	**223**
Farm payments					
Seed	0	260	0	0	0
Hired labour for cultivation	0	40	0	0	0
Fertilizer	200	0	90	0	0
Hired labour for harvesting	0	0	5	0	0
Marketing costs	0	0	7	0	0
Total farm payments	**200**	**300**	**102**	**0**	**0**
NET FARM RECEIPTS	**-200**	**-300**	**-63**	**0**	**223**
Non-farm receipts					
Remittances	0	0	0	70	0
Total non-farm receipts	**0**	**0**	**0**	**70**	**0**
Non-farm payments					
Living expenses	42	54	39	31	0
Total non-farm payments	**42**	**54**	**39**	**31**	**0**
NET NON-FARM RECEIPTS	**-42**	**-54**	**-39**	**39**	**0**
CLOSING CASH BALANCE	**318**	**-36**	**-138**	**-99**	**124**
HOUSEHOLD NET CASH INCOME	**-242**	**-354**	**-102**	**39**	**223**

Small Group Exercises: Cash Flow Budgeting

Exercise 4.1: Case study mixed cropping farm with limes, carrots, root crops and coconuts

A farmer grows four crops covering five acres on his eight-acre farm: limes, taro, giant taro and carrots. He also has some scattered coconut palms and five breadfruit trees. Carrots and limes are grown solely as cash crops while some taro, breadfruit, giant taro and coconuts in excess of family needs are sold in the local market.

The farmer makes the following cash sales during the year:

Limes:	$110 in March; $150 in April; $75 in May; $450 in June; $400 in July; $400 in August; $200 in September.
Carrots:	September $80; October $500; November $700; December $450.
Breadfruit:	December $300; January $200.
Taro:	July $130; August $220; September $150
Giant taro:	June $150; July $50.
Green nuts:	$15 per month.

Quarterly cash payments for crop enterprises are as follows.

Cost item/Quarter	January-March	April-June	July-September	October-December
Planting materials	50	196	195	0
Hired labour	0	290	640	0
Fertilizer	30	20	30	20
Chemicals	10	30	20	30
Transport and marketing	60	82	256	100

In addition to cash receipts and payments from the crop enterprises, tools worth $165 are purchased in the first quarter. The farmer expects to receive $600 in remittances, one-half in the second quarter and one-half in the fourth quarter. Family cash payments for living expenses and social obligations are expected to total $2,400 per year, $800 in the first

quarter, $600 in each of the second and fourth quarters and $400 in the third quarter. At the beginning of year 1, the farmer has $320 cash in the bank.

Tasks

Prepare a quarterly cash flow budget.

Calculate household net cash income for the year.

Would you advise the farmer to make an appointment with the loans officer at the Samoa Development Bank? Why/why not?

Exercise 4.2: Case study development of a semi-intensive piggery

This exercise is based on a 10-year planning period for a youth group that plans to build a piggery for 10 sows. The cost of the shed is estimated to be $6000 and the feed store is expected to cost $800. Construction should take six months, and production is planned to begin immediately the piggery is completed.

The group already has 7 sows and will purchase 3 gilts that cost $160 each in the first year. They will also purchase a one-year old boar that costs $160 in Year 1.

From Year 2 onwards, three sows are to be replaced each year by gilts bred in the piggery (which means there is no cash payment for the gilts). The sows are sold for $500 each. The boar is to be replaced every 3 years, and so is replaced halfway through Years 4, 7 and 10. The replacement boar costs $160.

In the first year, 32 weaners and 30 porkers are sold. In Years 2 to 10, 90 weaners and 84 porkers are sold. The weaners weigh 10 kg liveweight and the price is $4.50 per kg. The porkers weigh 50 kg dressed weight and the price is $5.50 per kg. Assume these sale weights and prices stay the same in all years.

Other cash payments for operating the piggery are as follows.

Cash payment item	Year 1 (Tala)	Years 2 to 10 (Tala)
Feed	11,000	22,000
Slaughter	220	440

Marketing and transport	110	220
Water	70	140
Veterinary	125	250

In addition to cash receipts from the piggery, the group expects to receive $800 in other funds. Payments for their other activities and to meet social obligations are expected to total $4000 per year. At the beginning of Year 1, the group has $1500 cash in the bank.

Tasks

1. Prepare a 10-year cash flow budget using one-year time intervals.
2. Assume that the group takes a loan of $10,000 from the Samoa Development Bank at 10 per cent interest rate on the first day of the first year. Interest is charged on the opening loan balance in each year, including full interest payment in the first year. Revise the 10-year cash flow budget prepared for Task 1.

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