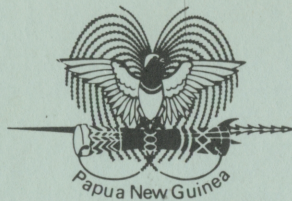


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FARM MANAGEMENT INFORMATION SYSTEM

FARM BUDGETING MANUAL 1991

FIRST EDITION



DEPARTMENT OF AGRICULTURE AND LIVESTOCK
POLICY, PROGRAMMING AND BUDGETING DIVISION

OCTOBER 1992

FARM MANAGEMENT INFORMATION SYSTEM:
DEPARTMENT OF AGRICULTURE AND LIVESTOCK
POLICY, PROGRAMMING AND BUDGETING DIVISION

FARM BUDGETING MANUAL 1991
FIRST EDITION

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FOREWORD

It gives me a great pleasure to release the first ever edition of a Farm Budgeting Manual 1991. The effort is very much consistent with the Government Policy to improve the extension delivery system in the agricultural sector. The extensionist and advisors are faced with multiple aspects related to the agricultural sector and especially a comprehensive set of issues requiring clarification.

This Manual is a first attempt to provide the agricultural extensionist with a tool aiming to assist the farmers in running farming activities in a more business oriented manner.

It provides a wide range of information not only related to cost of production, but also a wide range of expenditure that any advisor need to be fully aware of.

The whole concept behind is to give the agricultural workers the opportunity to understand not only issues related to Farm management, but also have access to industry information including volume of production, pricing, exports, etc..

Furthermore, this manual caress subsistence and semi-commercial farmers production systems, in order to facilitate the role of the extensionists in dealing with this complex farming system.

I trust this document will enhance the knowledge of our agricultural workers and especially benefit the farmers and villagers in the rural areas by having access to a more informed extensionist.

PAUL J SAI'I, OBE
Secretary

INTRODUCTION

1.0

This is the first Farm Budgeting Manual published by the Farm Management Unit(FMU) of the Policy Programming and Budgeting Division (PPBD) of the Department of Agriculture and Livestock(DAL).

The manual is produced as one component of the Asian Development Bank: Technical Assistance 1240 PNG : Strengthening DAL's Farm Management Information System. Other components of this TA have been the establishment of a regular and continuous monitoring system for the collection of farm management information for the largeholder and smallholder agricultural sector as well as a number of other special reports.

This manual is aimed at a number of users:

- a) Policy makers within DAL who require information for policy recommendations or project preparation
- b) Consultants who want a brief overview of PNG agricultural enterprises and exports and require a source of budgeting information.
- c) Extension workers who may use the manual to assist farmers and growers prepare location specific budgets.
- d) Others in the agricultural sector (farmers, service sector agencies) who require revenue and expense information or model budgets which they can adapt to their own particular situation.

The manual contains 3 sections

Section 1: Farm Revenue

Section 2: Farm Expenses

Section 3: Model Budgets for Smallholder and Largeholder enterprises.

Because of time and manpower constraints, this first edition of the manual is primarily a compilation of existing material from a number of different sources. The Farm Management Unit has not been able to verify the completeness or accuracy of all the information or budget data supplied. Consequently the FMU welcomes suggestions for improvement, both with respect to the information contained in the manual and the presentation of the data.

The manual should be updated annually with all Divisions of DAL making a contribution to this process.

Whilst this manual has been in preparation, it has been evident that a number of DAL Divisions and outstations have a significant body of data which may be collated for inclusion into a manual of this type. However, staff require the support of trained economists and Farm management Specialists if such data is to be presented within a sound economic framework.

A strengthened and vigorous Farm Management Unit should be the main agency within DAL for the collection, analysis and dissemination of this information in a useable form.

The manual has been modeled on the Farm Budgeting Manual produced annually by Lincoln University, Canterbury, New Zealand. Lincoln University also produce a companion volume called the "Technical Manual" which contains technical data of value to farmers for a number of purposes including farm budgeting. For example: fertiliser recommendations are given for crops, veterinary and medication requirements are stated for livestock.

In future editions of the Farm Budgeting Manual it is hoped to include such technical data as may be relevant to the individual budget models presented (eg: spray programme details, fertiliser inputs, labour input requirements). This has not been possible in all cases in the first edition.

There may be a case for DAL to prepare in addition, a Farm Technical Manual for field workers; the co-ordination of this might be the responsibility of the Training Division with input from specialists within a number of DAL divisions. Whilst many technical publications are available, the collation of such data into a readily accessible and regularly updated field manual is recommended.

2.0

MODEL BUDGETS

The models presented in this manual are of four types.

a) Cash Flow Budgets:

These budgets present revenue and expenditure cash inflows and outflows over a number of time periods; usually each time period is one year and the cash flow projection is made from the beginning of the project to the end of the project life.

These budgets are most relevant for comparing capital investment projects (with respect to resource use or investment return) or for examining the cash flow projection of a particular farm business for financial planning purposes.

Multi-period cash flow investment appraisal and budgeting is particularly suited to the evaluation of tree crops where several years may elapse

between the first planting of trees and mature levels of production.

b) Whole farm or enterprise annual budgets

These budgets usually reflect the status of the business over a one year period and include all working expenditure including variable costs and fixed overheads. For the export tree crop sector such annual budgets, when collected from a sample of growers, provide a means of monitoring the viability and production costs of the sector.

c) Gross Margin Budgets

Gross margins include only enterprise specific variable costs in budgeted costs. Gross margins are used mainly for comparative purposes (across enterprises and between holdings) caution is required to ensure that the exclusion of overhead (fixed) costs and capital costs does not invalidate such comparisons. In situations where comparisons require a change to fixed costs or capital resources, gross margin analysis alone is inadequate.

d) Costs of production

Costs of production have been used by Government policy makers to determine support prices for agricultural commodities where subsidies have been paid during periods of low world prices.

Such costs of production are usually determined for an efficient producer.

Costs of production include all working expenditure with the exception of interest on debt, taxation, capital replacement or development, and debt repayment. Interest on working expenditure is included in costs of production to reflect the requirement to service working expenditure on overdraft during the production cycle (usually one year). Depreciation, whilst being a non-cash expense, is included to account for the consumption of fixed resources over the production period.

For tree crops such as cocoa where crops eventually senesce and require replacement, allowance must be made for plantation redevelopment as part of costs of production. This may be done by either:

- a) including depreciation on trees as a cost in the expenditure items.
- b) calculating an annual payment (known as a sinking fund) which when invested at a the real rate of interest (net of inflation), for the life of the crop, will yield a future sum sufficient to redevelop that crop.

There is a paucity of good labour data in Papua New Guinea, particularly at the smallholder level. Where labour data has been available returns are presented on a man day basis as well as on the basis of net return after the deduction of labour costs.

One of the objectives of the Farm Management Unit of DAL is to improve the information available on labour resource requirement through the use of surveys and work study.

Whilst this manual is not intended to be a primer on budgeting methodology, some further discussion of budgeting and farm management terms is appropriate and follows in subsequent sections:-

4.0

WHOLE FARM ANNUAL BUDGET

Gross Income

Less: Variable Costs
 Less: Fixed/Overhead Costs
 (Including interest + depreciation)

= Profit Before Taxation

Less: Taxation
 Personal Drawings (for family owned and managed farm)
 Capital Purchases
 Development Expenditure
 Principal Repayments (on loans)

= Net Farm Surplus/(Deficit)

Since depreciation is *not* a cash item, it must be excluded from other cash items in the budget if a net "cash" surplus or deficit is to be calculated.

Interest will include both interest on working capital and interest on debt. For taxation purposes both interest and depreciation are deductible before taxable profit is calculated.

Depreciation is *not* a cash expenditure item but simply a reflection of the use of capital resources in a given time period; one year in the case of an annual budget.

The Annual Budget reflects the trading situation of the farm or holding in a particular year.

The balance sheet is a statement of assets and liabilities for a farm business at a particular point in time. Balance sheets are usually prepared at the end of an accounting year.

In Papua New Guinea, the accounting year is most commonly 1st January to 31st December.

Example:

LIABILITIES:	ASSETS:
NON-CURRENT LIABILITIES:-	FIXED ASSETS:-
Mortgages over land	Land (value of)
Term Loans	Plant/Equipment
	Buildings
	Livestock
CURRENT LIABILITIES:-	CURRENT ASSETS:-
Unsecured loans	Trade Debtors
Trade creditors	Shares/Investments
Bank overdraft	Cash on hand/bank
Equity (Balance):-	Stock on Hand
TOTAL LIABILITIES	TOTAL ASSETS

Equity is the excess of assets over liabilities

ie: Total Assets - Total Liabilities = Equity (Kina)

Equity may be expressed as a percentage thus:-

$$\frac{(\text{Total Assets} - \text{Total Liabilities})}{(\text{Total Assets})} \times 100 = \text{Equity \%}$$

In most cases equity may be expected to be positive, indicating that the business has a valuation for assets exceeding the value of liabilities. However, the true equity position of a farm business can only be evaluated if all assets and liabilities are valued at current market values (and not on historical costs which may be the figures showing in actual accounts).

Equity is the only comparative measure which reflects the state of the business in preceding years.

Losses carried forward increase liabilities thus reducing equity; profits reinvested or maintained as cash on hand or at bank, increase assets thus increasing equity. However, historical profits may also be invested outside the business and historical losses may be offset by an injection of outside capital.

6.0 GROSS MARGIN (For an enterprise)

Gross Margin is defined as Gross Income for an enterprise less variable costs.

Gross Margin = Gross Income - Variable Costs

7.0 GROSS INCOME

Gross Income for an enterprise is the volume of output for an enterprise x price per unit of output for that enterprise.

For a holding with more than one enterprise, the whole farm gross income is the summation of the gross income for the several enterprises.

Additionally, the holding may produce farm revenue not specific to any one enterprise: eg: hire of plant and equipment, lease of grazing.

For livestock enterprises purchases of replacement livestock are usually deducted from gross livestock income to give a figure for Gross Income net of livestock purchases.

There may be other off-farm income not generated by the farm which nevertheless affects the short-term viability of the business. (eg: off-farm earnings from employment, income from shares).

8.0 VARIABLE COSTS

These are cost which are

- (a) specific to that enterprise and
- (b) vary in proportion to the scale of enterprise (ie: number of hectares or number of head of livestock).

The main items of variable costs are:-

Crops: Fertilizer, chemicals, seed, casual labour and contract work specific to the crop.

Non-Grazing Livestock: Purchased feed, veterinary items, marketing expenses.

Grazing Livestock: As for non-grazing livestock plus forage crop variable costs (eg: pasture maintenance costs for the area allocated to the livestock enterprise).

Gross Margins are useful for comparative purposes; to compare enterprises on a single farm or holding or to compare the same enterprise on different holdings.

Fixed or overhead costs must be deducted from gross margin to calculate farm or enterprise profit.

Gross Margins calculated for enterprises can only be compared if there has been a standardization of the variable cost items. For example, if casual labour is hired for harvesting such labour is clearly a variable enterprise cost. If permanent labour is used for harvesting such labour may be regarded as an overhead of fixed cost. However, gross margins may only be compared if the permanent labour used in the harvesting operation is allocated as harvesting costs to that enterprise.

Enterprise gross margins should be compared with caution since certain enterprises may make more demands on capital resources than other enterprises - this needs to be adequately considered, when comparing the contribution enterprises make to profit.

9.0

FIXED COSTS OR OVERHEAD COSTS

Overhead costs are generally not easily allocable to enterprises. Examples of such costs are:-

- Management Salaries
- Administration Costs
- Insurance
- Fuel and Oil
- Permanent Labour
- Security
- Repairs and Maintenance
- Interest
- Depreciation (non-cash)

For planning purposes fixed costs may be allocated between enterprises on a per hectare basis, or allocated subjectively if it is considered one enterprise consumes more "fixed" resources than another. Other methods of allocating fixed costs to enterprises may be appropriate for mixed cropping systems (where more than one crop is grown on the same block of land).

With very detailed records (for example: accurate recording of vehicle use by enterprise and fuel consumption by vehicles) it may be possible to

point where the additional effort involved in such recording exceeds the value of the additional information gained.

Smallholders: From the various costs listed above it will be noticed that, in general, smallholder costs of production consist primarily of variable inputs. Labour is generally unpaid family labour or maybe paid for with exchange goods rather than cash. The only overhead cost may be some cash costs for repairs and maintenance and perhaps depreciation on small capital items (eg: coffee pulper, second hand vehicle used partly for farm use).

Largeholders: Large farms or plantations which are more formally part of the cash economy will have permanent hired labour, vehicle costs (repairs, depreciation and fuel/oil), administrative expenses (including accountancy charges), and interest on formal loans for working capital and on debt capital (term borrowings).

Consequently gross margins calculated for smallholders may have to cover few other farm related expenses whereas largeholder gross margins must cover significant levels of overhead costs of production.

Labour: Because smallholders may use primarily family labour in farm production, it is common to express gross margin as gross margin per person per day (total gross margin divided by total labour days over the period, usually one year). In this case labour costs are excluded from cash costs. Alternative enterprises may then be compared in terms of return to labour inputs (return per person day).

10.0

COMPARATIVE ANALYSIS

Gross Margin may be expressed in a number of ways: as:-

- a) Total gross margin for the holding or enterprise
- b) Gross margin per unit of input; such as area, labour day, or per kina invested.

In situations where land is limited the aim may be to maximise profitability, or gross margin, per unit of land area.

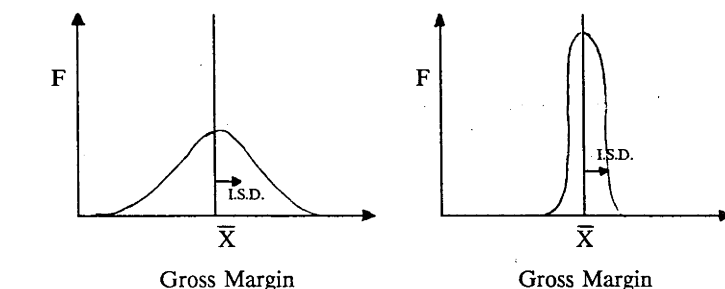
In situations where labour is limiting it may be more appropriate to maximise returns to labour.

Whilst some of the model budgets in this manual express return per person day it must be noted that there is limited information available on the labour inputs involved in smallholder production. Priority must be given to the accurate recording and monitoring of labour usage across enterprises, regions and methods of production.

In farming uncertainty is associated with future prices, levels of production, climatic adverse events and government policies with respect to support prices, market intervention and interest rates.

Gross Margins (or other measures of economic return) are most commonly expressed in terms of the most likely outcome. In a gross margin calculation, this would be the gross margin calculated given the expected price for output and expected yield given control over variable levels of inputs. The following diagram shows that the same expected value or mean gross margin may be associated with a different degree of risk.

Frequency Distributions of Gross Margins Associated with Different Levels of Risk.



$$\text{Mean} = E(X) = \bar{X}$$

F = Frequency

I.S.D. = One Standard Deviation

In example (a) the variation in the gross margin (as measured by the standard deviation) is much larger than for example (b). In other words whilst both examples may be associated with the same expected gross margin; in scenario (a) there is a much greater probability of achieving a gross margin significantly higher or lower than the mean value than is the case in scenario (b). where the variance is less.

Smallholders may prefer to adopt farming systems or crop varieties that are associated with small expected variations in returns (or yield) even if the expected returns may be lower than for some alternative enterprise or crop variety. This may be particularly so for staple food crop production upon which the family depends on for survival.

Some of the model budgets in this manual show Sensitivity Analysis tables which show the change of gross margin (or some other criteria) with a given change in level of production or price per unit of output. Whilst these tables show the range of results given arbitrary changes to the level of output and price, they say nothing about the likelihood of these levels of production or prices occurring (or the probability associated with these changes).

For example, for a particular year the price paid to maize growers may be fixed in negotiation with the feed mills supplied or by government. The agreed figure may be K200 per tonne with some adjustment for quality. On the other hand, Cocoa producers may face significant uncertainty regarding future prices since prices paid depend on world price with any subsidy being calculated as a percentage of this world price.

Gross margin analysis alone fails to evaluate risks and uncertainty with respect to production and marketing. If the probability of various outcomes were known (eg: probability distribution for price and yield) then a probability distribution could be calculated for gross margin (or some other criteria such as rate of return).

Further discussion of this topic is beyond the scope of this manual.

13.0

DEFINITION OF COSTS OF PRODUCTION

Farm and plantations costs can be divided into four categories:-

1. **Direct or variable costs** which are enterprise specific. For example: fertilizer applied to cocoa; harvesting; processing and dispatch costs for cocoa and copra (including crop freight).

Two types of direct or variable costs need to be identified for the purpose of calculating costs of production, these are:-

- i) Per tonne costs which vary with output (yield). These costs are harvesting, processing and dispatch costs. Costs are incurred for each additional unit of output.
- ii) Per hectare variable costs such as chemicals, fertilizer and crop husbandry.

2. **Overhead costs:** These costs are generally not enterprise specific and therefore cannot readily be allocated to enterprises. For example, accounting fees, managing agents costs, administration, security.

Some overhead costs may be consumed by one enterprise more than others. Fuel and oil, building repairs and maintenance are examples. However, because the detailed recording of the consumption of these inputs by each enterprise is impractical, these costs are usually considered to be overheads.

Where overhead costs are required to be assigned to enterprises some rule is required for apportioning these costs. Clearly, to calculate cost of production for a mixed cropping plantation overheads must be partitioned between crops (cocoa and copra for example). For monocropping properties (sole cocoa plantations) all overheads are engaged in producing the one crop or output.

On properties producing several crops and/or livestock in a monocropping environment (crops grown in sole stands); overhead costs are frequently assigned to enterprises on a per hectare basis.

In a mixed cropping environment, where two crops grow in one stand, allocating costs on a per hectare basis is inappropriate since the two crops are found on the same land area.

A number of means have been suggested for apportioning overhead costs to interplanted crops, including:-

- i) assigning costs on the basis of the estimated area occupied by each crop.
- ii) assigning costs depending on their relative output ratios.
- iii) assigning costs depending on the relative ratios of the crop's variable cost to total variable costs for all crops.

The advantage of the last method is that it assigns costs to the enterprises depending on their resource use for allocatable inputs. The crop using the greater proportion of variable inputs will be assigned the greater proportion of overheads (therefore increasing production costs relative to the other enterprise).

Interest on Working Capital: Since interest on debt maybe excluded from cost of production calculations it may be necessary to calculate interest on working capital. The following calculation is suggested for perennial tree crops:-

Pre-harvest costs less repairs and maintenance $\times \frac{1}{2} \times$ overdraft interest rate.

The rationale for this is that it may be assumed that the working capital carried on overdraft excludes harvesting costs (when income is received to cover expenditure outflows) and that repairs and maintenance may generally be delayed until positive cash flows generate a surplus at the bank. The assumption is that the average overdraft over the year is half the total working requirements (these being small during the first month after harvest, reaching a peak just prior to harvest).

Most plantation accounts or management records record redevelopment or development costs associated with immature non-bearing trees separately; however, not all overhead costs are recorded separately to mature and immature areas. Where overhead costs are to be allocated to mature and immature areas (to exclude all costs of redevelopment from trading statements) it is suggested that such costs are apportioned pro-rata on an area basis, after allocation to crops that may be interplanted.

3. **Costs of a capital nature:** where the purchased resource is consumed over more than one season.

For example equipment purchases, buildings, land development and crop establishment for perennial crops. Expenditure on these items are, as a general rule, not deductible for tax purposes in the year of expenditure but are depreciated over the useful life of the asset.

In calculating cost of production some estimate is required of the annual consumption of such resources since these resources are consumed in the process of production but over a longer period of time.

In annual accounts the tax allowable costs of capital ownership are interest and depreciation.

The costs of replacement of senile trees (cocoa blocks) should be regarded as one of the normal costs of production.

Where an industry is in a maintenance phase and no significant development is being undertaken, the depreciation or amortisation of the trees as recorded in accounts may be an adequate reflection of this cost.

Alternatively, this cost may be regarded as an annual payment into a sinking fund such that the sum of the annual payments plus interest (real rate of interest net of inflation) over the economic life of the trees yields sufficient funds to redevelop that crop.

4. **Other Items:** Other expenses are payable out of profit but are of a non-capital nature. These are taxation, debt repayment, and personal drawings (for owner managed plantations).

For the owner managed plantations management fees should be imputed so that the data for these properties are standardised on the same basis as plantations run by management agents, where management fees are charged.

Development expenditure (whilst of a capital nature) is deductible for tax purposes in the year of expenditure (as an incentive for development). Losses may be carried forward indefinitely in the Papua New Guinea Primary Industry Sector.

Since the primary use of the cost of production estimates will be to assist in the determination of the stabilisation support prices, cost of production is expressed on a per tonne basis.

14.0 CASH FLOW BUDGETS

Cash flow budgets show the flow of revenue and costs for an enterprise (or enterprises) or for a capital investment project over time.

For farm planning purposes, cash flows may be prepared on a monthly basis for a farm or holding to evaluate the need for working capital requirements and to compare actual results for a production year with forecast results.

Such forecasts for a particular farm or holding may extend over several years although it is more usual for only the current year to be evaluated on a month by month basis.

Cash flows are also used to evaluate capital investment projects where a large capital investment may require several years of operation before yielding a positive return or investment.

Such cash flow analysis takes into account the time value of money where early returns are valued more highly than later returns of a similar magnitude.

It is not intended to present a full discussion here of discounted cash flow analysis. However, some of the models in this manual are of this type, particularly those provided by the Project Preparation Branch of PPBD where the model farm budgets form part of a wider capital appraisal programme.

The two commonly presented criteria for such cash flow models are:-

- a) Net Present Value (NPV)
- b) Internal Rate of Return (IRR) or FIRR (Financial Internal Rate of Return)

There are two distinct presentations made for these models.

- (i) Constant kina models
- (ii) Current kina models

Constant kina models are used to calculate the "real" return for an investment over and above inflation. All revenue and cost flows are expressed in constant money values (for example, future cost and revenue flows are expressed in 1991 kina values).

Where commodity price projections are available these may show increasing or decreasing real price trends. This being the case these trends are reflected in the cash flow projection by higher or lower future prices expressed in 1991 kina values.

Similarly, if particular costs are thought to vary significantly relative to costs expressed in 1991 kina values these relative changes may be incorporated into future cash flows.

The internal rate of return is the discount rate (interest rate) which results in a net present value of zero. In simple terms consider this the break-even "real" discount rate (or interest rate).

- If the IRR is greater than the desired rate of return (rate of interest), the investment is financially attractive.
- If the IRR is equal to the desired rate of return an investor would be indifferent toward the investment.
- If the IRR is less than the desired rate of return the investment is not financially attractive.

The Net Present Value is the current value (in today's terms) of the cash flow (years 1 through n) which results after applying the percentage (%) discount factor (or interest rate) shown on the analysis.

- If the NPV is positive, the financial value of the investor's assets would be increased: the investment is financially attractive.
- If the NPV is zero, the financial value of the investor's assets would not change: an investor would be indifferent toward the investment.
- If the NPV is negative, the financial value of the investor's assets would be decreased: the investment is not financially attractive.

If government loans and grants are available only for one specific purpose, there may be no alternative investment opportunity. In this case any positive rate of return, accompanied by reasonable risk may be acceptable.

When constant costs and prices are used in the economic evaluation, the rates of return calculated are "real" rates. The analysis is net or any inflationary effects. In simple terms, this is the same as saying that the real return on an interest bearing deposit is only 5% when the apparent (nominal) rate paid is 8% but the inflation rate is 3% (ie: 8% less the inflation rate of 3% equals 5%).

Current kina cash flow forecasts, on the other hand, build inflationary expectations into the model. Costs are inflated by the expected rate of inflation for labour and other inputs. Similarly, revenue may be inflated in nominal terms given inflationary expectations (although determining what this inflationary expectation is may be complex for commodities produced and sold in several global markets).

The main purpose of such current (nominal) price models is to determine medium term actual costs or budgetary requirements for projects at the project level (government funding requirements) and to determine likely loan requirements and repayments where loan financing of projects is required by Government or Banking Institutions.

All cash flow budgets included in this manual are expressed in **constant** kina terms (mainly 1991 money values) since the objective of the manual is to show likely cash inflows and outflows in constant money values together with calculated values for NPV and IRR.

Loan requirements will vary for specific projects and for individuals. Analysts may have different expectations regarding future inflation rates.

It is left for analysts to adapt the models presented to specific project or investment proposals and to apply their own borrowing strategies and inflationary expectations to the cash flow forecasts.

15.0

LIVESTOCK MODELS AND TRADING ACCOUNTS

Most of the livestock models presented in this First Edition of the Manual are based on one year annual budgets (or gross margin calculations) with the herd or flock at a steady state. (A status quo situation where animal numbers are neither increasing nor decreasing).

Such a steady state model assumes that opening and closing livestock numbers remain constant with replacements being either purchased, or retained from animals bred on the farm.

This is necessary for comparative purposes since if closing numbers are greater than opening numbers then livestock are being retained rather than sold - some of the production for the period (year) is going to increasing capital livestock valuations.

On the other hand, if closing numbers are lower than opening numbers, livestock capital values are decreasing and the sale of capital stock (eg: sale of breeding animals) is incorrectly being attributed to production.

16.0 TAXATION

Taxation is not covered in this manual. Few smallholders pay tax; either incomes are low or, where incomes are high, then there are many individuals to whom wages may nominally be paid or income distributed in order to bring individual incomes to below taxable levels.

The manual presents models, whereas, income tax pertains to the financial circumstances of individuals.

For the plantation sector all development expenditure is deductible for taxation purposes in the year of expenditure or may be carried forward as losses to be deducted against income in future years.

Additionally, in Papua New Guinea, losses may be carried forward for more than seven years as a concession to the primary sector.

The representation of taxation payments in largeholder cost of production or monitoring models requires reference to a sample of actual survey results for holdings.

With the exception of the cocoa plantation sector (surveyed by the Farm Management Unit in the first half of 1991) such information is not generally available in Papua New Guinea).

FURTHER READINGS:

For a further coverage of farm management research and the tools used in farm planning and budgeting the reader is referred to the following publication:-

"Farm Management Research for Small Farmer Development"
by John I. Dillon and J. Brian Hardaker

Pub: FAO: Agricultural Services Bulletin 41, Rome 1984
ISBN 92-5-100822-1

1.0 CASH CROPS

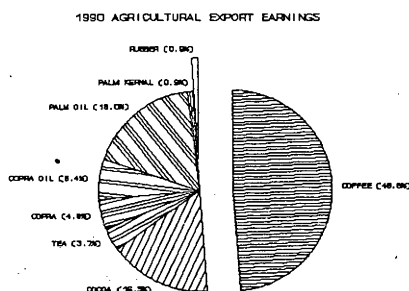
1.1 EXPORT EARNINGS

Export earnings from the agricultural sector fluctuate in accordance to changes in world prices. Agricultural export earnings reached K381 million in 1984 and have fallen subsequently. Earnings for 1990 were K181.5 million the lowest since 1982.

Export earnings for the major commodities, for 1989 and 1990 were as follows :

	1989 (K millions)	1990 (K millions)
Coffee	140.0	88.6
Cocoa	44.0	29.9
Tea	6.7	6.7
Copra	16.5	8.7
Copra Oil	15.7	11.6
Palm Oil	37.9	32.7
Palm kernel	1.6	1.6
Rubber	2.7	1.7

Agricultural exports account for 17 % of total exports in 1990. The other source of exports come from the mining, forestry and marine sectors.



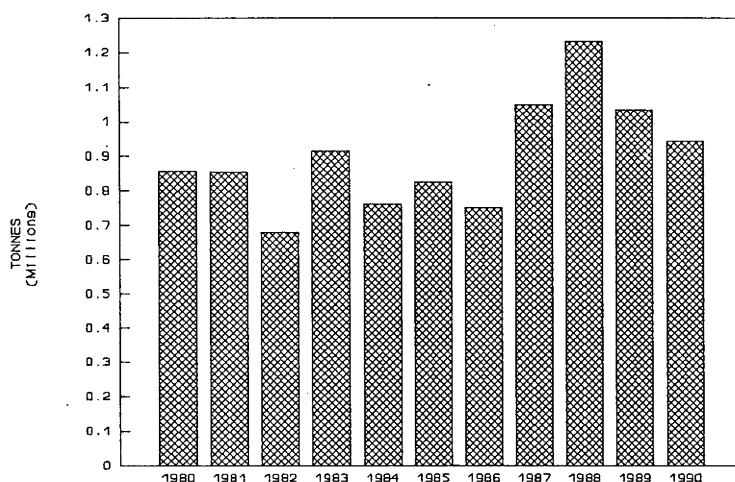
Source : Ministerial Brief for Parliament, 1991

1.2 COFFEE

1.2.1 Production

The graph below shows coffee production in million tonnes for 1980-1990. Output before 1987 was below the 1 million tonne mark. But in 1987-1989 production exceeded the 1 million mark. The 1990 production fell to 0.9 million tonne

COFFEE PRODUCTION, PNG



Source : Coffee Industry Board of PNG.

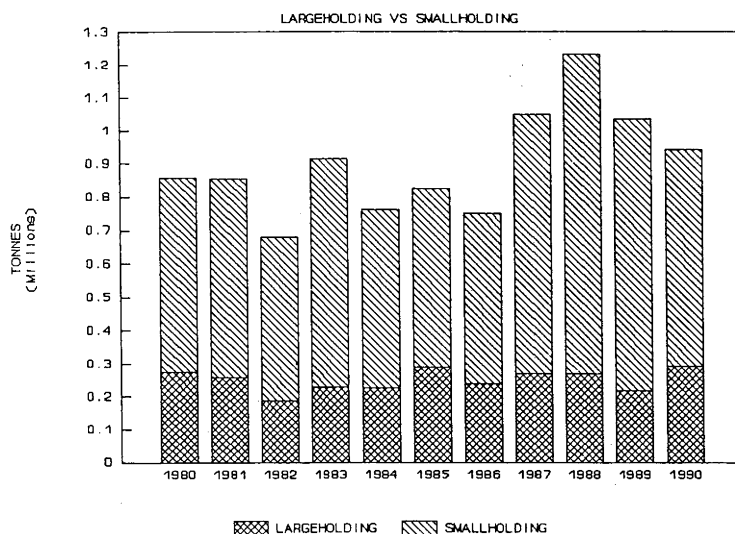
1.2.2 Largeholder versus Smallholder Production

The graph below shows coffee production by largeholder and smallholder sector for 1980-1990. For the ten year period, total smallholder production was higher (72 %) than the largeholder sector (28 %). In 1988 when record production was achieved, smallholder's output was high (78 %) as compared with largeholder (22 %)

SECTION 1

FARM REVENUE

COFFEE PRODUCTION, PNG



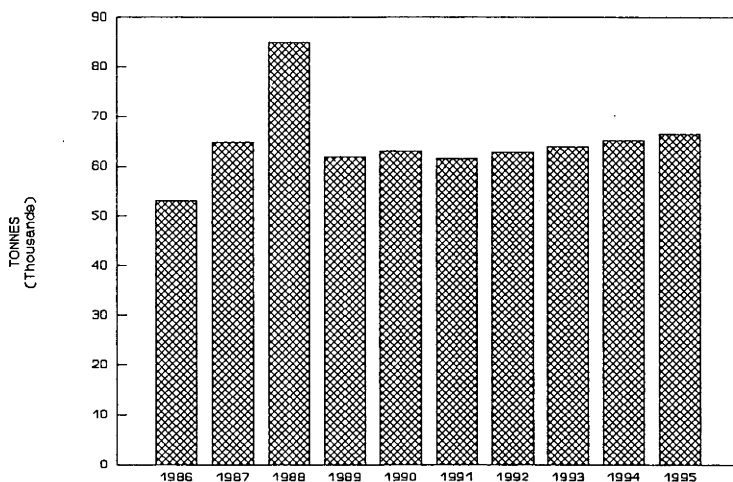
SOURCE : Coffee Industry Board of PNG

1.2.3 Exports

Papua New Guinea has a small share of the world coffee market therefore internal coffee output does not have any impact on the world supply and demand and hence price.

Exports in 1987 were kept artificially low due to a stock-holding exercise by the Coffee Industry Board, designed to increase PNG International Coffee Organisation (ICO) quota. In 1988 coffee exports were a record high of over 80,000 tonnes. Last year 1990 exports were above 60,000 tonnes. The failure of the ICO to agree on a new quota agreement, has allowed the possibility of increased sales to ICO member countries. PNG coffee is in strong demand on the world market due to its high quality and mild flavour and exporters should be able to sell all that PNG grower's can produce.

COFFEE EXPORT BY VOLUME, 1986-1995.



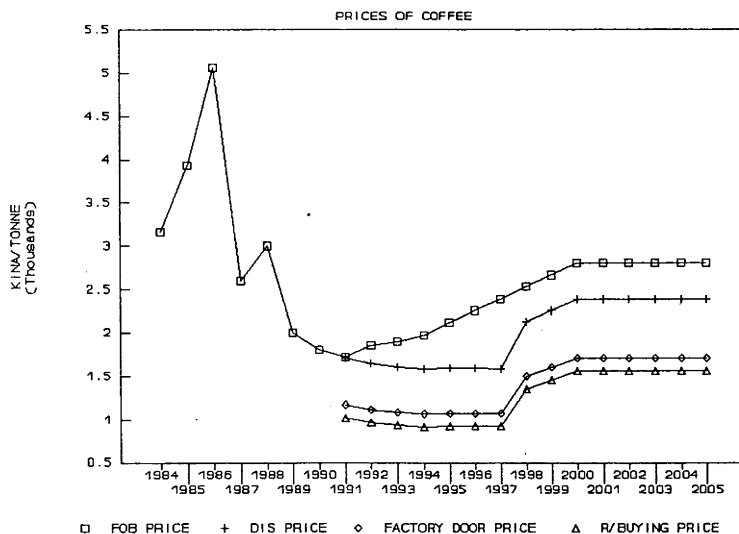
Source: Ministerial Brief for Parliament, 1991

1.2.4 Prices

Increasing World supplies, falling consumption and the suspension of export quotas as a result of the collapse of the International Coffee Agreement have caused major falls in the price received by PNG growers for their coffee. FOB prices which reached a peak of K5,000 per tonne in early 1986, fell to K1,718 in 1990. Current average FOB prices are around K1.73 per kilogram. This is due to the relative shortage of quality arabica coffee on the world market. Prices are expected to remain at similar levels throughout 1991 and beyond. The long-term outlook for coffee is not so promising, as the market situation which has given rise to very low prices (excess of supply over demand) still persists.

The DIS price in 1991 was K1,710/tonne. DIS price is predicted to remain steady until 1997 before rising moderately. The factory door price in 1991 is K1,168/tonne, slightly higher (15 %) than the roadside price of K1,018/tonne. It can be seen from the graph that the factory door and roadside prices are predicted to remain steady until 1997 before rising moderately.

FOB, FACTORY DOOR AND ROADSIDE BUYING



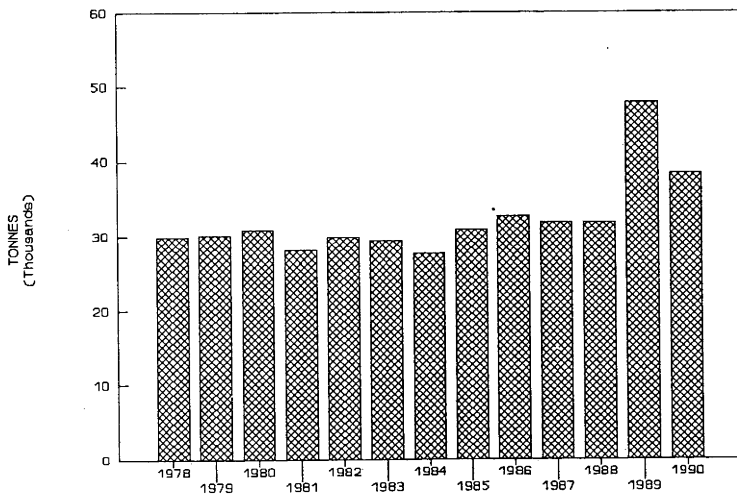
Source: D.A.L, P.P.B.D, Strategy and Planning Unit.

1.3 COCOA

1.3.1 Production

The graph below shows cocoa production in thousand tonnes for 1978-1990. Output for 1978-1988 was below 32,000 tonnes. In 1989 production reached 47,800 tonnes, up from 31,800 in 1988. The large increase in production during 1989 can be attributed to the improved yields from new hybrid planting materials. However, output fell in 1990 to 32,400 tonnes due mainly to the disruption caused by the Bougainville crisis and low prices. Other contributing factors were; bad weather in Rabaul in 1990 and more recently outbreak of vascular streak dieback in Madang and particularly on KarKar Island.

COCOA PRODUCTION PNG

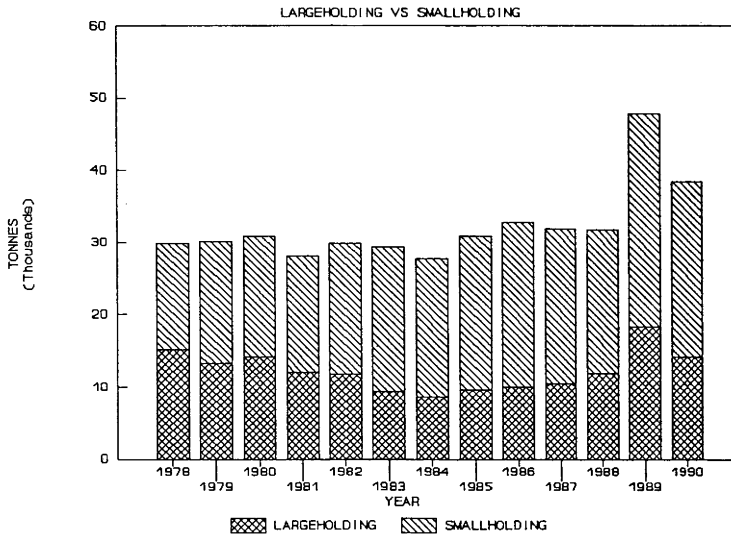


SOURCE : Cocoa Board of Papua New Guinea.

1.3.2 Largeholder versus Smallholder Production

The graph below shows the comparison of cocoa production between largeholder's and smallholder's. Generally, smallholder productions are slightly higher than largeholder's except in 1978 where largeholder (51 %) and smallholder (49 %) production were nearly the same. In 1989 when record production was 47,800 tonnes, smallholder's output was 62 % whereas largeholder's output was 38 %. For the 12 year period, total smallholder production was higher (62 %) than largeholder's (38 %).

COCOA PRODUCTION PNG

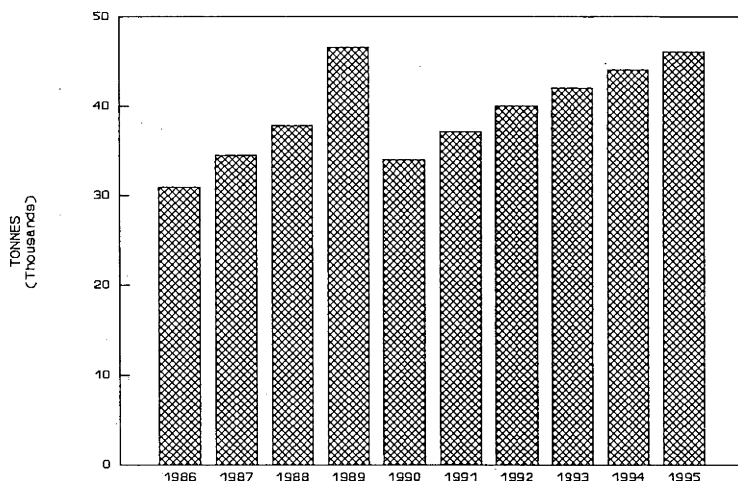


SOURCE : Cocoa Board of Papua New Guinea.

1.3.3 Exports

Exports have grown in line with production and in 1989 over 47,000 tonnes were exported, mainly to Europe. The exports for 1990 decreased to 35,810 tonnes. The graph also shows projection of cocoa export to 1995. PNG cocoa is still sold on the world market as 75 % "fine or flavour" grade and the indications are that exports should continue to command this premium over lesser quality cocoa from other nations

COCOA EXPORT BY VOLUME, 1986-1995

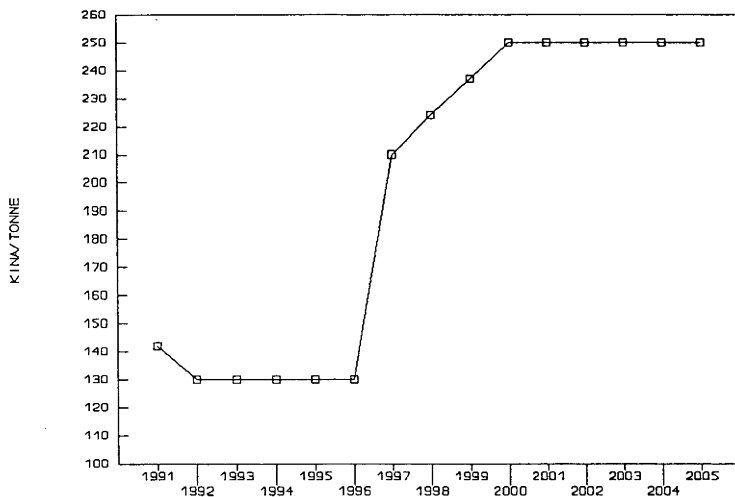


SOURCE : Ministerial Brief for Parliament, 1991

1.3.4 Prices

The 1989/90 was the seventh year of cocoa surplus production. With the cocoa market being oversupplied the prices of cocoa have continued to decline with temporary increases. With such big stocks over hanging the world market, prices are expected to remain low over the short to medium term. DIS price after 1991 is predicted to climb steadily whereas farmgate price is predicted to remain constant.

GROWER PRICE OF COPRA



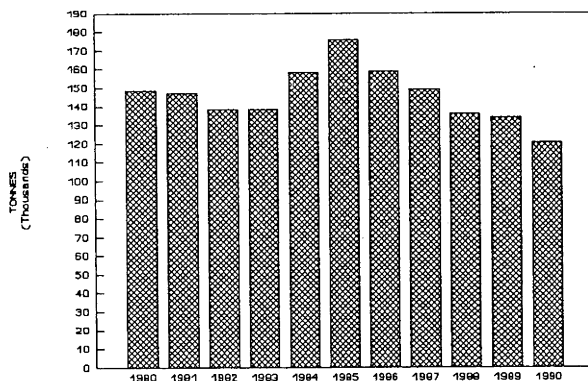
SOURCE : D.A.L, P.P.B.D, Strategy and Planning Unit

1.4 COPRA

1.4.1 Production

Copra production has fallen steadily from 175,834 tonnes in 1985 to 120,356 tonnes in 1990. The reason for this fall has been the decline in prices. Approximately half of PNG'S copra is crushed into copra oil before being exported. Smallholder output in particular has declined. Smallholder however still produce between 60 - 65 % of the copra produced in PNG and will continue to be the major producer. The 1990 production was also lower due to the Bougainville crisis.

COPRA PRODUCTION BY VOLUME, 1980-1990.

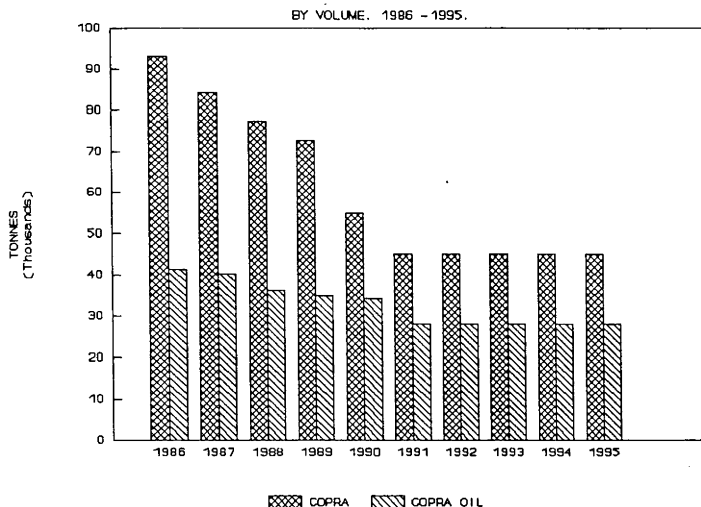


SOURCE : D.A.L, P.P.B.D, Strategy and Planning Unit Commodities Brief.

1.4.2 Exports

Raw copra exports have fallen from 92,000 tonnes in 1985 to 55,000 tonnes in 1990. Export of copra oil have correspondingly fallen to their lowest levels.

EXPORT OF COPRA AND COPRA OIL,

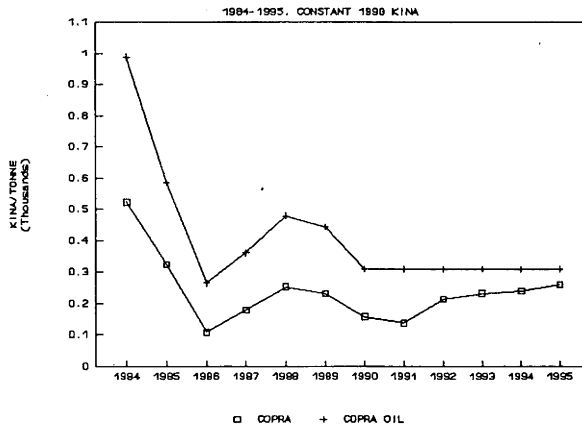


SOURCE : Ministerial Brief for Parliament, 1991.

1.4.3 Prices

FOB prices for copra peaked in 1984 at K523 per tonne. In 1986 prices fell back to K113 per tonne, but recovered to reach K253 in 1988. Strong competition from other oils, such as palm oil, soya and rape-seed has acted to keep prices relatively low, and prices through 1989 averaged K230 per tonne. In 1990 prices fell again to an average of K158 per tonne. Prices are expected to rise gradually at the beginning of 1991, and remain that way beyond. Copra oil prices are almost double the prices of raw copra and the trend of the copra oil prices closely follow the copra price as shown in the graph below. Copra oil price peaked in 1984 at K989.00 per tonne, then declined to K265.00 per tonne in 1986 and rose modestly to K482.00 per tonne in 1988.

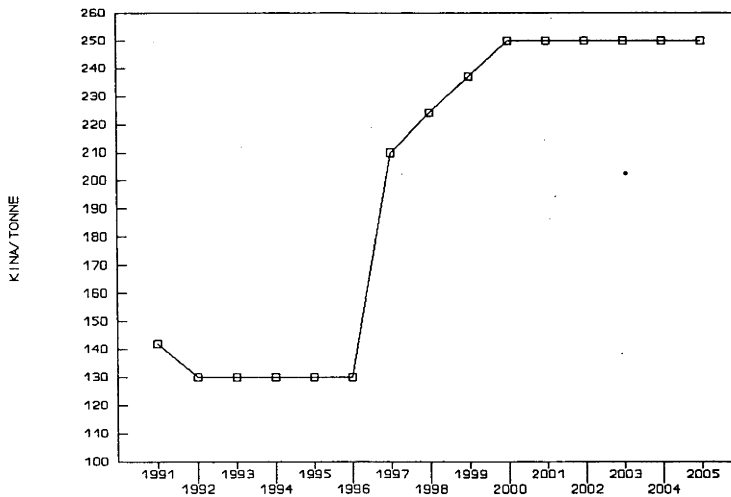
FOB COPRA AND COPRA OIL PRICES,



SOURCE : Handbook on Agricultural Statistics, 1989 and Ministerial Brief for Parliament, 1991.

The graph below shows the growers price projection from 1991 - 2005.

GROWER PRICE OF COPRA



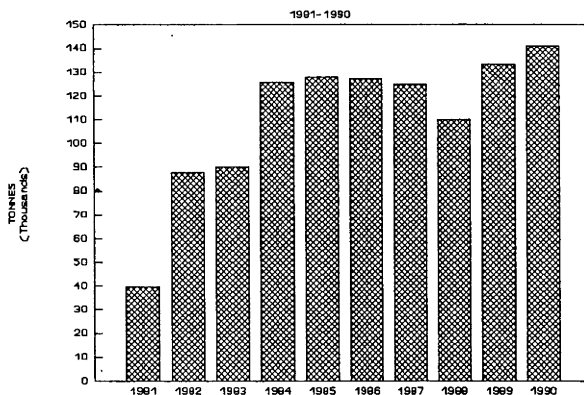
Source : D.A.I, P.P.B.D, Strategy and Planning Unit.

1.5 OIL PALM

1.5.1 Production

Production rose steady up to 1986, after which low world prices lead to declining production. 1989 and 1990, however, with increased hectareage under Oil Palm have seen record production, with 141,163 tonnes Oil Palm production in 1990. With increased plantings, and the opening of new schemes, projections are for production of 250,000 tonnes Oil Palm by 1991.

OIL PALM PRODUCTION BY VOLUME.

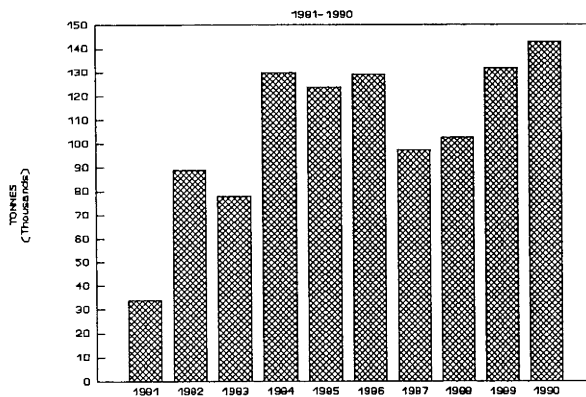


SOURCE : D.A.L, P.P.B.D, Strategy and Planning Unit Commodities Brief.

1.5.2 Exports

Export rose steady to 1986, declined in 1987 - 1988 then rose again in 1989 and 1990.

EXPORT OF OIL PALM BY VOLUME.

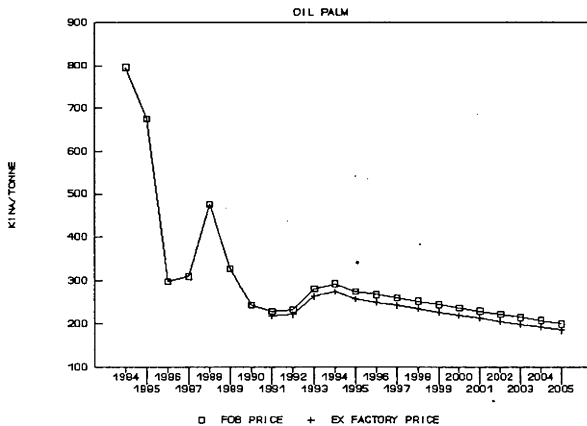


SOURCE : D.A.L. P.P.B.D, Strategy and Planning Unit Commodities Brief.

1.5.3 Prices

Prices are largely determined by the market for vegetable oils as a whole. Price supports policies particularly in the United States of America, and Europe have led to over supply and hence declining world market prices. The world market is also characterised by a high degree of fluctuation in prices. In 1984 FOB prices averaged K796 per tonne, falling to K297 per tonne in 1986. Prices again fell towards the end of 1989, but have remained almost constant throughout 1990 at K243 per tonne. Prices are forecasted to rise gradually after 1991 and beyond. The ex factory price is predicted to rise gradually after 1991 as depicted in the graph.

FOB AND EX FACTORY PRICES OF



SOURCE : D.A.L, P.P.B.D, Strategy and Planning Unit.

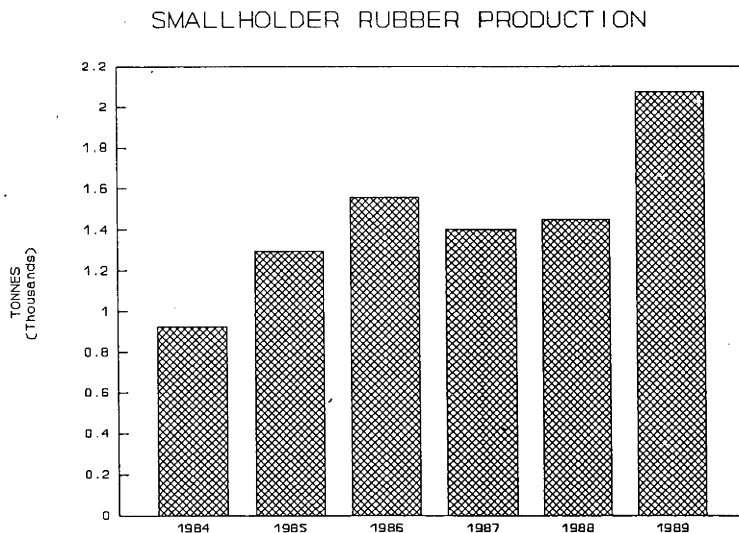
1.6 RUBBER

1.6.1 Production

Production peaked in 1970 at 6,400 tonnes, since then production declined to the lowest in 1982 at 2,337 tonnes. Production has gradually increased since then to 4,900 in 1989. However production fell substantially in 1990 to 3,700 tonnes.

This is primarily due to low world prices and particularly wet weather in 1990.

1.6.2 Smallholder Rubber Production



SOURCE : Ministerial Brief For Parliament, 1991 and Handbook on Agricultural Statistics, 1989.

Encouragement was given to open up 3,255 hectares of mature trees for tapping from existing smallholders. Additional 3,000 tonnes of cup-lump rubber is expected as a result of tapping the untapped trees to raise annual rubber exports from an average 5,000 tonnes to 8,000 tonnes by 1991.

1.6.3 Domestic Rubber purchasing from Rubber Growers in selected provinces

Manus Province

Rubber was established in Manus in the 1960's and purchases commenced in the early 1970's. The first village plantings were in areas relatively close to Lorengau, the provincial capital. The villages in this area have sealed road access and no obvious marketing impediments.

East Manus Villages: Rubber Purchases, 1985-1991

	1985	1988	1990	1991 ^a
Sample Farmer	9	9	9	9
Number of Producers	9	5	2	0
Number of Sales	19	5	2	0
Volume (kg)	2317	829	310	0
Value (K)	1009	314	71	0
Price (K/Kg) ^b	0.44	0.38	0.23	0.21
Av Income per Producer	K112.11	K62.80	K35.50	K0.00

^a 1991 data is to July only.

^b Wet weight prices - assumed 70% DRC.

Taskui, New Hanover Island, New Ireland Province:
Rubber Purchases, 1989-1991

	1989	1990	1991 ^c
Sample Farmer	10	10	10
Number of Producers	7	8	6
Number of Sales	11	23	10
Volume (kg)	2379	5540	2746
Value (K)	732	1444	690
Price (K/Kg) ^d	0.31	0.26	0.25
Av Income per Producer	K104.57	K180.58	K115.00

^c 1991 data is to July only.

^d 70% DRC.

**Lomaku, Mussau Is, New Ireland Province:
Rubber Purchases, 1988-1991**

	1988	1989	1990	1991 ^a
Sample Farmer	10	10	10	10
Number of Producers	7	9	10	10
Number of Sales	7	21	37	15
Volume (kg)	1468	6355	8939	4424
Value (K)	484	1900	2350	1106
Price (K/Kg) ^b	0.33	0.30	0.26	0.25
Av Income per Producer	K69.14	K211.11	K235.00	K110.60

^a 1991 data is to July only.

^b 70% DRC.

On Mussau Island, approximately 6 hours boat travel from Kavieng, rubber has been planted in recent years and tapping (on 115 tappable hectares) only commenced in 1988.

Gulf Province

The Murua Settlement Scheme was established in the early 1960s as part of the Administration's approach to develop cash crops in selected areas of the country (the initial Cape Rodney rubber plantings were also undertaken in this period). A low-cost approach was followed with little infrastructure being provided.

**Murua Rubber Settlement Scheme, Gulf Province:
Rubber Purchases, 1988-1991**

	1977	1985	1990	1991 ^a
Sample Farmer	38	38	38	38
Number of Producers	38	34	32	32
Number of Sales	10	4	4	4
Volume (kg)	42974	17134	24570	16900
Value (K)	23152	3599	5161	3524
Price (K/Kg) ^b	0.54	0.21	0.21	0.21
Av Income per Producer	K609.25	K105.84	K161.28	K110.13

^a 1991 data is to July only.

^b 70% DRC.

Western Province

There are well over 100 rubber growing villages in Western Province. Most no longer tap their rubber due to poor marketing and low prices.

Aketa Village, Western Province: Rubber Purchases, 1989-1991

	1989	1990	1991 ^a
Sample Farmer	10	10	10
Number of Producers	10	9	7
Average Sales/Block	14	21	19
Volume/Block (kg)	841	841	1232
Volume (kg)	8410	13224	8628
Value (K)	1614	2449	1544
Price (K/Kg) ^b	0.21	0.18	0.18
Av Income per Producer	K171.44	K272.14	K220.50

^a Actual Jan-Sept; projected Oct-Dec 1991

^b 70% DRC.

Kotale Village

Kotale village is located between Kawito and Balimo and also benefits from relatively close proximity to buying services at the Kawito Mission.

Kotale Village, Western Province: Rubber Purchases, 1989-1991

	1989	1990	1991 ^a
Sample Farmer	10	10	10
Number of Producers	10	8	5
Average Sales/Block	7	8	7
Volume/Block (kg)	371	624	839
Volume (kg)	3713	4992	4196
Value (K)	798	922	755
Price (K/Kg) ^b	0.21	0.18	0.18
Av Income per Producer	K79.77	K115.33	K151.06

^a Actual Jan-Sept; projected Oct-Dec 1991

^b 70% DRC.

Togowa and Adiba Villages

Both villages sell their rubber at the Kawito Mission, less than 2 hours away by canoe.

Togowa Village, Western Province: Rubber Purchases, 1989-1991

	1989	1990	1991 ^a
Sample Farmer	10	10	10
Number of Producers	10	8	10
Average Sales/Block	17	8	8
Volume/Block (kg)	1079	588	596
Volume (kg)	10793	4710	5692
Value (K)	2215	851	1028
Price (K/Kg) ^b	0.21	0.18	0.18
Av Income per Producer	K221.14	K106.36	K102.84

^a Actual Jan-Sept; projected Oct-Dec 1991

^b 70% DRC.

Adiba Village, Western Province: Rubber Purchases, 1989-1991

	1989	1990	1991 ^a
Sample Farmer	10	10	10
Number of Producers	10	6	8
Average Sales/Block	9	4	5
Volume/Block (kg)	496	219	358
Volume (kg)	4955	1311	2863
Value (K)	1007	230	515
Price (K/Kg) ^b	0.21	0.18	0.18
Av Income per Producer	K100.73	K38.33	K64.42

^a Actual Jan-Sept;

^b 70% DRC.

Atkamba Village, North Fly

Atkamba was a leading rubber producing village in the North Fly area up to the mid - late 1980s. Located on the Alice River the village is within the direct zone of influence of the large Ok Tedi Mining venture. Progress Company, a Kiunga based private company, has been the main rubber purchaser in the area since the mid 1980s.

Atkamba Village, Western Province: Rubber Purchases, 1985, 1988, 1989-1991

	1985	1988	1990	1991 ^a
Sample Farmer	39	39	39	39
Number of Producers	39	39. ^b	10. ^b	n/a
Av Sales/Producer	1	3. ^b	**	0
Volume/Block (Kg)	590	992	275	0
Volume (kg)	22993	38710	2754	0
Value (K)	4604	11463	551	0
Price (K/Kg) ^c	0.20	0.30	0.20	0.20
Av Income per Producer	K118.07	K29.92	K55.08	K0.00

^a Rubber sales have ceased in 1991. In-village purchasing ceased in 1989-1990.

^b Consultant estimates

^c 70% DRC

East Sepik - Purchase at Gavien

No village level data are available for the East Sepik Province. However, the rubber growing villages tend to be as isolated and poorly served as the majority of the North, Middle and South Fly areas of Western Province. As a result of these villages are no long exploiting their stands of rubber. The following data was from factory records at the Gavien Rubber Settlement at Angoram, East Sepik Province.

**Gavien Rubber Scheme, East Sepik Province:
Rubber Purchases, 1989-1991**

	1989	1990	1991 ^a
Sample Farmer	91	119	107
Number of Producers	91	119	107
Average Sales/Block	1.95	4.3	41.6
Volume/Block (kg)	615	2495	1135
Volume (kg)	56496	299800	136976
Value (K)	11864	65958	28765
Price (K/Kg)	0.21	0.21	0.21
Av Income per Producer	K130.37	K529.06	K268.83

^a Actual Jan-Sept;

Source : Bruce Carrad, Consultancy Draft Report, December 1991

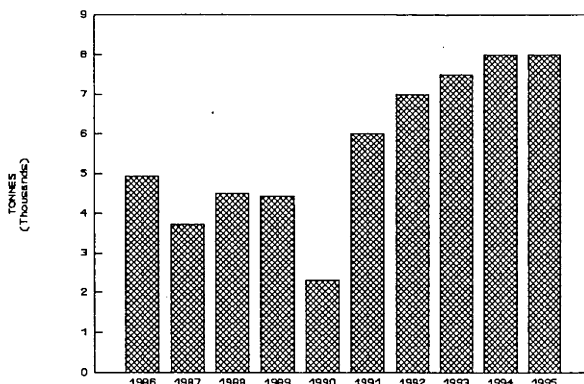
1.6.4 Exports

The grades of rubber exported from 1978 to 1981 were largely RSS1, 2 and 3. Since then the PNG CR10 and CR20 increased in importance with PNG CR10 accounting for 92 % of rubber exported.

Most of the rubber is exported to Europe, with West Germany being the largest importer. Australian import tonnage decreased dramatically since 1985 from 4,500 to 51 tonnes in 1989. This was mainly due to reviewing of the tariff structures by the Australian Government.

Export of rubber is forecasted to increase to 8,000 tonnes by 1995.

RUBBER EXPORTS BY VOLUME, 1986-1995

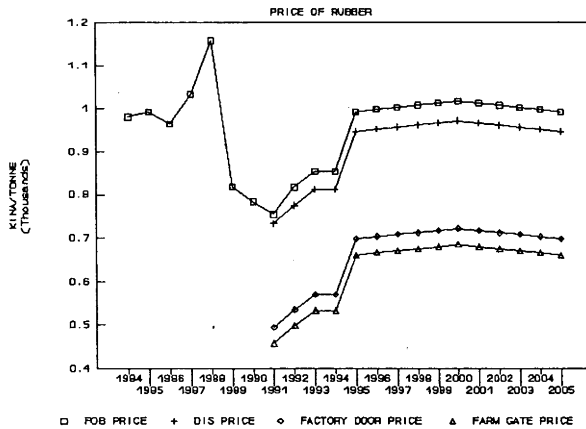


Source : Ministerial Brief for Parliament, 1991.

1.6.5 Prices

The rubber prices has stabilized since late 1989 with the exhaustion of the international natural rubber organisation's buffer stock. The change taking place in the world, in particular those in Eastern European countries were the move is towards democratization and market driven economies means that the consumption of natural rubber is expected to increase in the long run. However, due to short run cash flow problems in much of Eastern Europe prices are expected to remain depressed in the short run. The FOB prices have fluctuated significantly from a low of K965 per tonne in 1986, to K1,033 in 1987. 1990 FOB prices were K783 per tonne. Current FOB prices are around K754 per tonne. The graph below also shows the DIS, factory door and farm gate price projection for rubber.

FOB, DIS, FACTORY AND FARM GATE

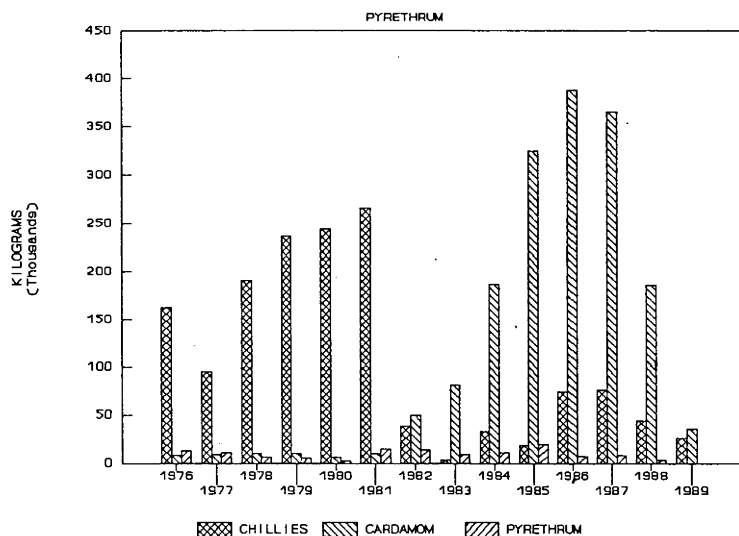


Source : D.A.L, P.P.B.D, Strategy and Planning Unit.

1.7 MINOR CROPS

Minor crops consists of cardamom, chi lies, pyrethrum and tea. These four crops account for less than 5 % of agricultural exports.

EXPORTS OF CHILLIES, CARDAMOM AND



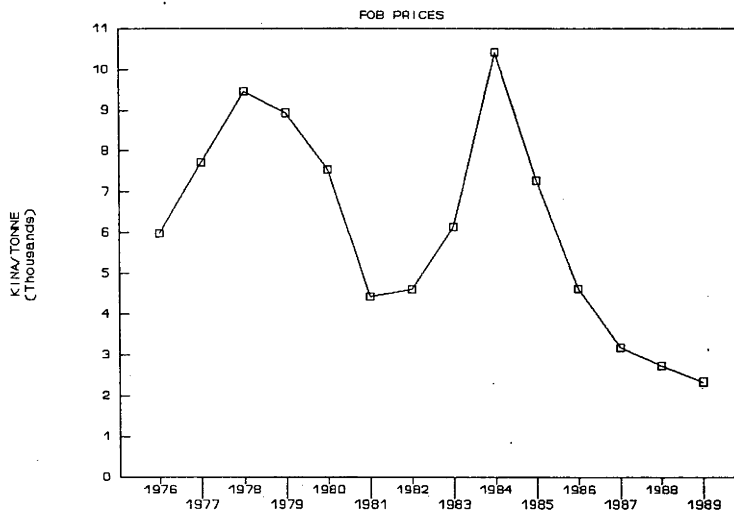
Source : National Statistical Office.

1.7.1 Cardamom

Exports increased from 6 tonnes (see section 1.7) in 1980 to 387 tonnes in 1986 and declined to 35 tonnes in 1989 (Jan-Jul figures only). Export earnings peaked at K2.3 million (1985), but have fallen to K0.5 million (1989). Prices peaked in 1978 at K9,447.00 per kilogram and in 1984 at K10,428.00 per kilogram and has subsequently declined since.

Production in India fell in 1983-84 as a result of a drought causing the prices to rise. During the same period a lot of cardamom producing countries such as Guatemala, Honduras, Tanzania and Malaysia began new planting of cardamom. Guatemala and Honduras production occurred in 1986, thus flooding the small market, causing the prices to fall. The world price fluctuation are reflected on the cardamom price trend in PNG.

PRICE TREND FOR CARDAMOM

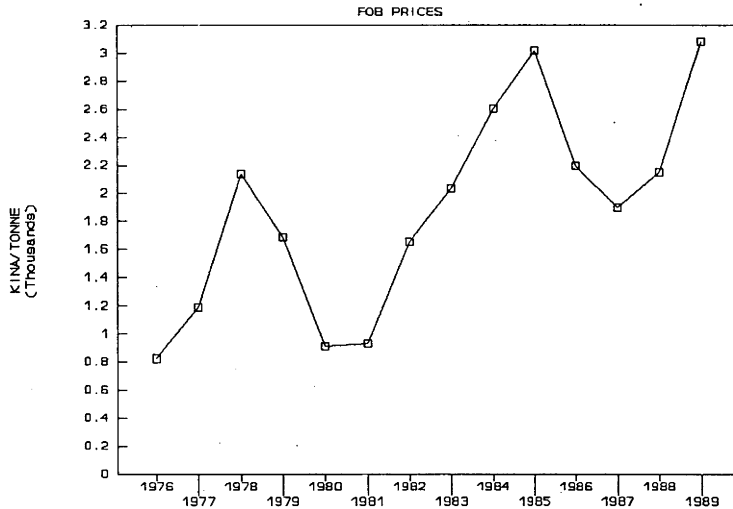


Source : National Statistical Office.

1.7.2 Chillies

Exports declined (see section 1.7) from 266 tonnes (1981) to 72 tonnes (1989) due to withdrawal of heavy DPI marketing support. Export earnings fell from K0.2 million (1981) to K0.09 million (1988). Prices fluctuated from K2,601 per tonne (1984) to K2,152 (1988). Two peaks are seen in the graph, one was in 1978 and the other in 1985.

PRICE TREND FOR CHILLIES

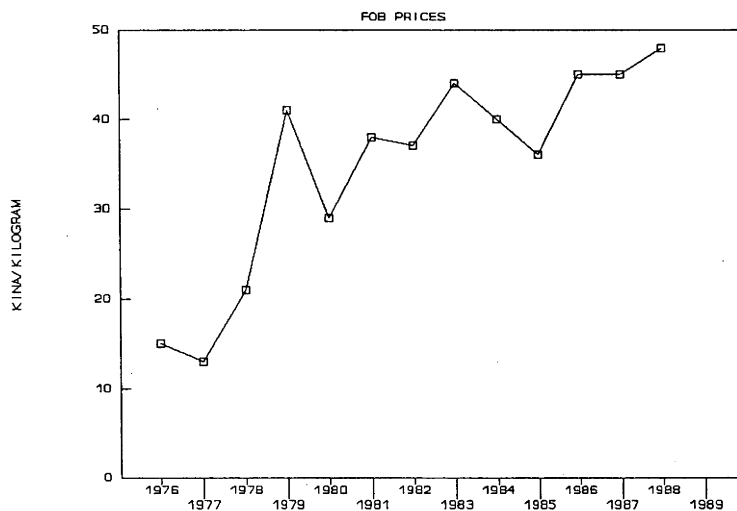


Source : National Statistical Office.

1.7.3 Pyrethrum

Export peaked (see section 1.7) in 1985 at 19 tonnes then declined to 3 tonnes in 1988. Export earning ranged from a low of K85,000 in 1980 and peaked in 1985 at K704,000 then fell to K148,000 in 1988. Price range from an average of K13 per kilogram in 1977 to K48 per kilogram in 1988. The price trend climbed steadily from 1976 to 1989.

PRICE TREND FOR PYRETHRUM

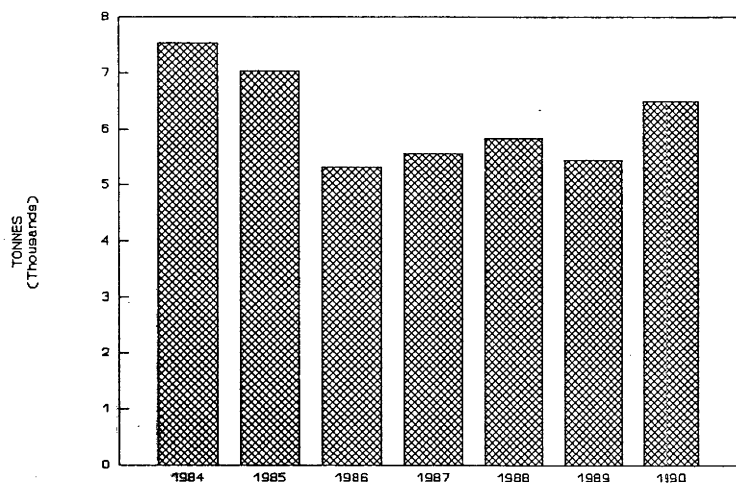


Source : National Statistical Office

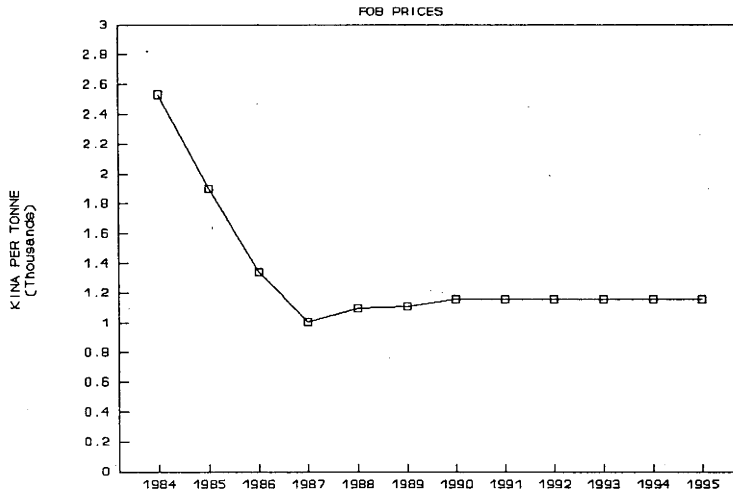
1.7.4 Tea

Export peaked in 1984 at 7,530 tonnes and then gradually declined in 1985. It remained steady between 1986 - 1989 from 5,322 - 6,393 tonnes before climbing to 6,500 tonnes in 1990. Tea price was at a high in 1984 and has gradually declined since then. Tea prices are predicted to remain steady beyond 1991

EXPORT OF TEA BY VOLUME, 1984 - 1990



PRICE TREND FOR TEA

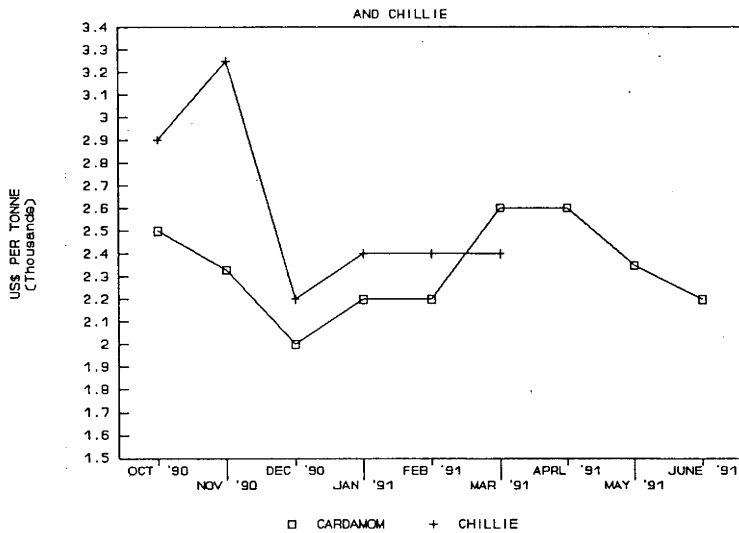


Source: D.A.L., Handbook on Agricultural Statistics, 1989.

1.7.5 Cardamom and Chillie - World Price Trend

The graph below shows the world price trends of cardamom and chillie between October 1990 and June 1991. Chillie prices of April, May and June 1991 are not available.

WORLD PRICE TRENDS OF CARDAMOM



Source : D.A.L., P.P.B.D, Quarterly Commodity Market Report, 1991.

2.0 FOOD CROPS

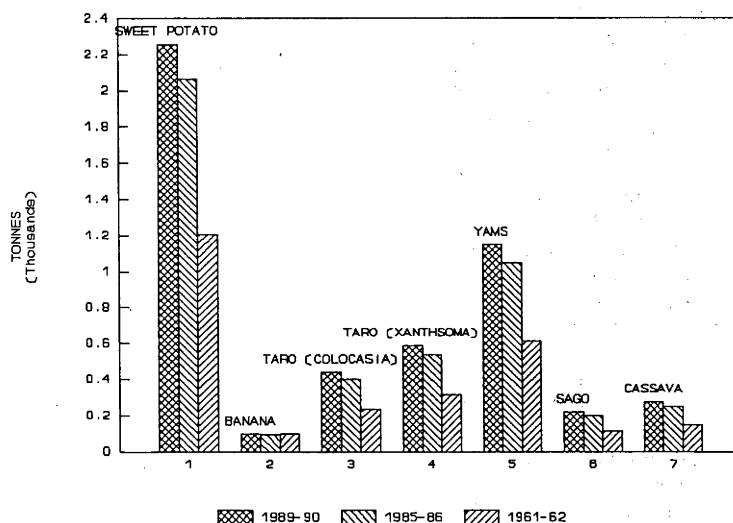
Food crops in PNG are grown at two levels :

1. Subsistence or traditional level.
2. Semi-commercial and commercial.

2.1 SUBSISTENCE OR TRADITIONAL FOOD CROP PRODUCTION.

Production and yield of the traditional staple food crops are difficult to established. Some estimates have been made on local production and the trends are shown in the graph below:

TRENDS OF LOCAL PRODUCTION OF STAPLES



Source : D.A.L, Food Management Division.

Annual production of introduced food crops such as potato, greens, salads and fruit is estimated to be around 10,000 tonnes. Estimates of subsistence level production of some important introduced foods is indicated in the table below;

Subsistence Level Production of some introduced Food Crops, in Tonnes.

Crops	1982	1984	1989
Rice	374	250	356
Sorghum	500		7000
Potato	957	3024	7000
Groundnut in shell	(Markham	Valley only)	400
Greens			1500
Salads			1300
Fruit			500
Maize-Stock Feed	500	3200	

Source : D.A.L, Food Management Division.

2.1.1 IMPORT SUBSTITUTION OF VEGETABLES

A recent review of the Fresh Produce Development Company carried out jointly by New Zealand and PNG team in October/November of 1991 found that in the last two years, PNG has produced sufficient fresh produce to replace virtually all previously imported vegetables, and meet a 11 % per annum demand (excluding onions and process potatoes). The substitution would not have occurred effectively without the influence of the Fresh Produce Development Company.

The demand figure for introduced fresh vegetables has increased since 1987 from 11,206 tonnes to 15,433 tonnes in 1991 through the formal markets. There are now huge quantities of introduced fresh produce being marketed through the informal markets, with quantities estimated at least five times the formal market. A huge percentage of the production of traditional and introduced fresh produce is produced and consumed as subsistence agriculture.

Results of a national demand survey for vegetables conducted in 1987 and 1991 showed that broccoli is one of the major growth items, going from a total demand in the country of 41 tonnes in 1987 to 355 tonnes in 1991. Capsicum has shown comparable growth, going from 85 tonnes in 1987 to 278 tonnes in 1991. Other vegetables such as beans, cabbage, capsicum, cauliflower, celery, cucumber, eggplant, lettuce, onion, potato, pumpkin, silverbeet, sweet corn, tomato and zucchini have also shown growth. The only exception was carrot which did not show a growth in demand.

Source : Review of the Fresh Produce Development Company, October/November 1991. A Joint New Zealand and Papua New Guinea Project.

Refer to Tables containing 1988 annual figures of the quantity of produce offered, sold and average prices of vegetables, fruits and root crops in major urban market.

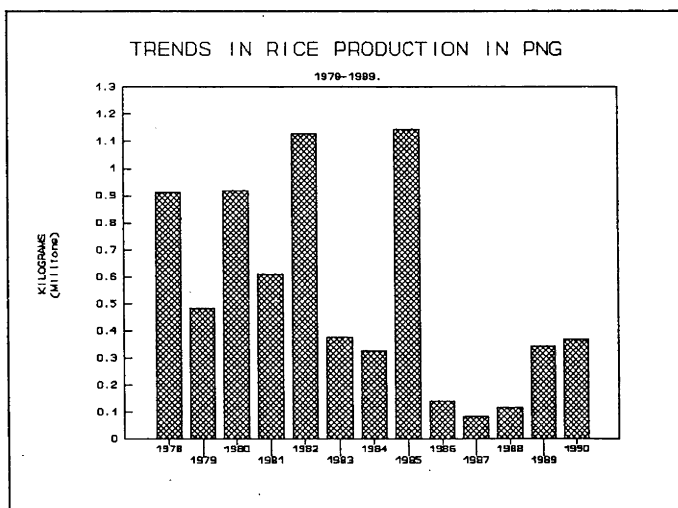
2.3

COMMERCIAL FOOD CROP PRODUCTION

2.3.1

Rice

As an introduced crop in PNG, rice has fast become an important staple food in PNG. Attempts to produce rice in PNG has not met with much success, and has been attributed to the labour intensive methods of cultivation adopted in small scale rice production, and the intense capital requirement for large scale rice production which makes its production unprofitable, especially when compared with tree and cash crop production. The graph below shows the trends of rice production in PNG over a period of thirteen years. The data indicates that total rice production in PNG would be not more than an average of 500 tonnes per year, which is a negligible quantity considering the country's annual requirement of over 135,000 tonnes. The year 1982 and 1985 recorded a highest production of 1,128 and 1,143 tonnes respectively. The decline in production after 1985 to 1990 can be attributed to minimal financial support from the government to the local farmers in supporting the projects.



Source : D.A.L, P.P.B.D, Strategy and Planning Unit.

2.3.2 Maize and Sorghum

A large proportion of feed for livestock consumption is imported of which maize and sorghum account for some 60 %. The total demand for animal feeds is estimated at about 51,600 tonnes per annum of which feeds account for about 30,600 tonnes.

Sorghum and maize are grown mainly in the Markham Valley of the Morobe Province. The possibility of domestic production of sorghum and maize replacing imported feeds depends on the yield and the producer price related to production costs.

Some maize is imported. The largest producer of maize in the Markham Valley, Sulikon Pty sells its maize at K200.00/tonne. Sorghum is imported but has a slightly lower nutritional value than maize. Sorghum's price is about K5.00 - K10.00 less the price of maize.

Source : Papua New Guinea European Economic Community, Livestock Development Corporation Future Development Study, 1991.

QUANTITY OF PRODUCE OFFERED, SOLD AND AVERAGE PRICES IN MAJOR URBAN MARKET: 1988

MARKET	KOKI			GORDONS			MT. HAGEN			LAE MAIN			RABAUL		
	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg
Kaukau	279,086	128,617	0.66	301,699	264,912	0.69	815,175	770,767	0.30	3,664,851	2,232,573	0.27	842,319	589,195	0.24
Cooking banana	847,142	655,587	0.50	856,071	680,794	0.52	475,638	473,766	1.32	1,252,828	711,524	0.46	112,170	100,857	0.37
Mau banana	88,350	63,040	0.71	169,385	127,810	0.63	189,130	181,399	0.69	131,648	99,167	0.33	232,902	191,718	0.27
Bual	256,188	236,077	2.24	498,919	416,393	2.80	0	0	0.00	1,307,723	919,333	0.62	265,339	233,919	0.60
Dry coconut	800,516	508,986	0.31	752,411	568,500	0.28	60,748	60,748	0.38	1,048,402	823,943	0.16	37,856	34,990	0.07
Taro tru	43,509	38,755	0.91	94,071	89,601	0.67	201,275	201,275	0.63	619,336	413,006	0.65	1,060,338	799,367	0.45
Tarokong	269,178	208,219	0.57	194,001	175,039	0.68	87,314	87,314	0.95	506,179	375,927	0.52	118,641	85,234	0.22
Peanut	126,888	99,440	1.90	81,038	56,522	1.88	295,210	295,210	1.15	586,921	317,173	0.44	13,358	11,706	1.50
English cabbage	171	171	0.84	13,912	8,827	1.16	1,173,201	1,042,635	0.41	550,384	184,441	0.39	11,972	10,446	1.41
Yam	89,009	54,884	(0.62)	104,809	79,113	0.43	85,696	85,696	0.29	192,332	113,456	0.82	0	0	0.00
Potato	19,201	3,435	0.71	31,702	14,901	0.68	580,401	570,128	0.41	365,237	255,331	0.70	1,618	1,618	0.86
Tomatoes	8,133	3,322	1.21	19,326	18,848	1.99	181,792	177,828	51.00	99,889	72,121	1.27	39,428	32,124	0.96
Carrots	0	0	0.00	0	0	0.00	145,635	142,607	0.48	40,347	29,591	0.74	3,132	3,132	1.92
Oranges	31,247	30,838	0.71	44,294	24,058	1.66	184,427	181,480	0.47	204,015	179,022	0.93	27,144	23,816	1.06
Mandarines	41,473	34,648	1.72	33,283	11,443	1.74	85,026	77,318	0.96	22,201	18,539	0.52	319,731	243,961	0.40
Cucumber	38,140	14,571	0.60	70,946	65,224	0.61	173,252	173,252	0.45	120,317	64,797	0.16	13,786	11,648	0.20
Pumpkin	51,870	30,974	0.33	119,426	85,779	0.33	177,193	170,884	0.54	705,448	661,489	0.93	103,330	78,624	1.06
Mango	54,111	53,508	1.72	156,008	154,825	1.74	0	0	0.00	41,939	32,760	0.55	29,813	27,780	1.40
Chinese cabbage	0	0	0.00	12,240	10,306	1.11	10,180	10,180	1.17	143,339	53,927	0.00	5,824	5,593	1.48
Pakchoi	0	0	0.00	1,843	1,843	0.59	4,738	4,738	0.50	0	0	0.00	13,774	12,873	0.86
Capsicum	0	0	0.00	43,350	29,177	3.41	84,390	84,390	0.47	59,428	52,170	0.60	79,433	61,233	0.24
Pawpaw	22,568	16,642	0.57	214,476	193,148	0.50	290,576	278,131	0.65	92,697	28,392	0.42	17,969	14,780	0.62
Pineapple	35,365	30,804	0.89	193,546	164,847	0.66	76,140	71,332	0.64	92,812	77,064	0.70	13,767	12,707	0.43
Albika	55,726	42,508	0.66	84,289	75,257	0.78	18,431	18,431	0.20	121,795	106,605	0.44	51,572	43,356	0.51
Chokotops	0	0	0.00	0	0	0.00	7,442	7,442	0.33	222,998	180,139	0.34	734,344	590,004	0.51
Others	1,061,253	868,777		966,807	742,048		2,026,209	1,966,883		3,684,901	2,608,960				
TOTAL	4,219,124	3,123,803		5,057,872	4,059,215		7,429,219	7,133,834		15,877,958	10,613,450		4,290,985	3,356,717	

Note - These figure are annual estimates based on the preliminary results of the Food Crop Market Survey conducted in 1988.

SOURCE: RURAL STATISTICS SECTION, DAL.

QUANTITY OF PRODUCE OFFERED, SOLD AND AVERAGE PRICES IN MAJOR URBAN MARKET: 1988

MARKET	KAINANTU			MENDI			KAVIENG			MADANG MAIN			ALOTAU		
	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg
Kaukau	90,076	77,422	0.39	27,664	22,032	0.12	190,545	189,783	0.32	127,772	87,639	0.23	96,631	88,602	0.58
Cooking banana	103,345	100,813	0.44	1,577	1,375	0.43	44,789	30,376	0.31	349,407	265,479	0.25	110,356	88,880	0.74
Mau banana	21,611	21,097	0.35	25,399	23,973	0.50	21,268	20,401	0.30	124,094	97,492	0.20	17,837	17,837	0.59
Bau	125,929	88,837	0.80	0	0	0.00	157,907	99,077	1.01	152,880	192,832	1.30	93,698	79,395	2.26
Dry coconut	119,973	101,079	0.27	0	0	0.00	31,737	28,531	0.15	191,190	166,181	0.12	78,667	59,075	0.24
Taro ru	1,101	945	0.32	576	576	0.42	35,033	40,525	0.59	72,712	44,550	0.31	21,412	16,466	1.06
Tarokong	14,113	13,343	0.71	6,764	6,431	0.16	123,517	98,869	0.39	331,640	237,629	0.22	16,230	15,995	0.75
Peanut	67,878	41,450	0.76	21,739	17,118	1.16	14,525	8,840	1.35	99,512	72,827	0.67	0	0	0.00
English cabbage	73,228	52,728	0.37	8,898	6,774	0.27	8,909	8,632	1.04	326,188	245,659	0.36	0	0	0.00
Yam	0	0	0.00	0	0	0.00	8,528	5,217	0.42	84,125	69,970	0.25	80,915	59,632	0.95
Potato	47,140	35,128	0.56	26,805	15,682	0.25	0	0	0.00	36,980	15,813	0.71	20,213	19,806	0.56
Tomatoes	2,992	2,305	0.39	2,295	1,901	0.59	676	520	1.67	13,350	9,623	0.52	3,833	2,291	1.22
Carrots	2,276	2,276	0.35	11,587	9,494	0.51	0	0	0.00	21,183	15,387	1.42	214	214	1.60
Oranges	50,434	30,493	0.48	3,792	3,165	1.15	29,016	28,548	0.77	0	0	0.00	3,854	3,597	1.46
Mandarines	16,903	16,573	0.59	0	0	0.00	0	0	0.00	0	0	0.00	13,489	6,102	1.47
Cucumber	67,640	14,581	0.38	16,805	16,107	0.47	3,484	3,449	0.43	139,891	134,603	0.29	7,002	4,475	0.79
Pumpkin	1,147	1,046	0.25	4,459	3,630	0.35	14,231	9,135	0.33	8,884	5,994	0.14	13,104	9,121	0.51
Mango	22,510	21,280	0.59	0	0	0.00	0	0	0.00	13,432	13,432	0.00	0	0	0.00
Chinese cabbage	17,628	9,865	0.36	8,918	5,753	0.27	20,505	20,211	0.67	32,448	23,843	0.30	171	150	7.27
Pakchoi	0	0	0.00	0	0	0.00	6,171	3,172	0.97	0	0	0.00	0	0	0.00
Capiscum	0	0	0.00	0	0	0.00	5,599	5,599	2.07	0	0	0.00	0	0	0.00
Pawpaw	1,661	1,202	0.17	0	0	0.00	11,544	10,660	0.19	50,265	41,857	0.20	5,738	4,775	0.36
Pineapple	3,368	2,257	0.71	1,871	1,446	0.53	3,848	3,727	0.50	118,412	97,787	0.43	12,376	9,207	0.68
Abika	1,083	853	0.18	1,436	1,314	0.31	17,732	17,004	0.50	66,883	55,979	0.25	18,029	13,952	0.37
Chokotops	2,010	1,918	0.26	0	0	0.00	129,705	129,203	0.26	6,470	4,450	0.35	0	0	0.00
Others	152,687	113,210		162,799	134,134		295,429	278,079		1,139,128	922,699		213,775	182,343	
TOTAL	1,006,733	750,901		333,384	270,905		1,194,698	1,039,758		3,506,846	2,821,725		827,564	683,935	

QUANTITY OF PRODUCE OFFERED, SOLD AND AVERAGE PRICES IN MAJOR URBAN MARKET: 1988

MARKET	POPONDETTA			WABAG			VANIMO			KOKOPO			LORENGAU		
	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg	Offered (kg)	Sold (kg)	Price k/kg
Kaukau	510,659	192,777	0.18	88,764	75,948	0.14	25,904	18,914	0.35	361,858	212,129	0.23	38,518	36,477	0.52
Cooking banana	267,187	123,308	0.35	1,968	1,788	0.28	88,195	63,817	0.25	172,411	99,934	0.17	50,265	48,247	0.45
Mau banana	22,579	13,137	0.29	16,008	11,820	0.32	9,756	7,353	0.32	16,536	10,078	0.22	5,614	5,394	0.56
Bau	128,977	64,858	1.86	0	0	0.00	56,759	36,082	1.03	216,965	163,894	0.30	56,817	48,964	0.71
Dry coconut	95,699	47,364	0.17	0	0	0.00	50,367	37,221	0.22	0	0	0.00	23,704	23,230	0.24
Taro tru	48,478	28,458	0.58	0	0	0.00	7,581	1,627	0.50	154,128	94,130	0.37	13,060	13,060	0.85
Tarokong	227,125	101,909	0.42	1,848	828	0.68	27,557	20,556	0.43	174,970	99,310	0.50	17,229	17,229	0.67
Peanut	60,964	11,427	1.66	22,116	14,484	0.66	3,601	1,847	0.73	145,361	80,808	0.65	9,276	8,041	0.76
English cabbage	0	0	0.00	29,364	21,420	0.23	346	346	0.31	468	468	0.76	0	0	0.00
Yam	71,598	33,951	0.28	132	132	0.19	4,073	2,875	0.47	0	0	0.00	4,886	4,677	0.96
Potato	0	0	0.00	77,364	59,592	0.27	0	0	0.00	0	0	0.00	0	0	0.00
Tomatoes	22,513	7,313	0.71	1,068	576	0.34	548	51	0.63	7,550	5,398	0.43	33	0	0.00
Carrots	0	0	0.00	30,000	26,784	0.47	0	0	0.00	0	0	0.00	0	0	0.00
Oranges	16,987	11,427	0.34	0	0	0.00	455	438	0.74	0	0	0.00	949	783	0.24
Mandarines	221	99	1.33	0	0	0.00	0	0	0.00	811	655	0.98	397	176	0.50
Cucumber	50,651	28,227	0.47	6,444	5,832	0.61	2,058	1,830	0.55	63,492	46,862	0.35	5,471	3,739	0.42
Pumpkin	26,164	10,368	0.36	15,396	11,004	0.21	1,434	742	0.18	0	0	0.00	13,487	14,218	0.73
Mango	993	993	1.33	0	0	0.00	0	0	0.00	10,514	9,454	0.98	0	0	0.00
Chinese cabbage	496	342	0.47	27,456	20,352	0.30	2,294	1,164	0.31	1,560	1,373	0.93	11	11	0.57
Pakchoi	16,137	11,218	0.33	0	0	0.00	0	0	0.00	406	281	1.28	0	0	0.00
Capsicum	10,203	5,934	0.21	0	0	0.00	329	110	1.00	187	94	1.09	0	0	0.00
Pawpaw	13,258	8,372	0.21	0	0	0.00	7,555	5,582	0.17	5,928	1,841	0.15	7,942	7,809	0.38
Pineapple	21,619	11,913	0.62	4,608	4,608	0.36	2,572	1,417	0.13	11,856	10,452	0.29	13,589	13,457	0.32
Aibika	53,298	31,591	0.11	5,424	3,600	0.28	28,308	21,874	0.32	32,323	24,118	0.36	8,240	7,865	0.51
Chokotops	43,349	21,542	0.25	10,332	9,432	0.17	0	0	0.00	10,982	10,826	0.32	0	0	0.00
Others	650,347	380,634		180,708	139,592		119,015	85,075		217,464	126,017		194,541	181,239	
TOTAL	2,359,502	1,147,162		519,000	407,592		438,707	308,721		1,605,770	998,122		466,029	434,616	

Livestock production is similar to food crops production, in that there are two levels of production : subsistence and semi-commercial /commercial. PNG is almost 100 % self sufficient in chicken meat and eggs, and is partially self-sufficient in pork. About 6 % of pork is imported mainly to fill the local production shortfalls, most of it is directed to small goods processing. Local production of lamb is negligible and PNG is virtually 100 percent import dependent for lamb and mutton. Beef imports have increased by 43 % as a result of increased consumer demand and industrial growth in the mining sector. This has also been compounded by the establishment of the beef canneries in the country.

The 1992 Government budget have removed the import bans on poultry and eggs.

3.1 SUBSISTENCE LIVESTOCK PRODUCTION.

Nearly all rural households are engaged in some sort of subsistence livestock production with pigs and chickens being the dominant animals found in village level farming. The value of annual production for pigs and chicken is estimated to be 40 million kina and the quantities being as follows :

Pigs approximately 1.5 million heads.

Chicken approximately 1.85 million birds.

3.1.1 Pig Sales at Village Market

Prices for adult pig range from a minimum of K 400.00 in the coastal area to a maximum of K 1,000.00 in the Highland region.

3.1.2 Chicken Sales at Village Market

Prices range from K 7.00 to K 10.00 for broiler.

3.1.3 Goat Sales at Village Market

Goats are sold for meat purpose's.

Buck K 30.00 per head

Doe K 30.00 per head

Wethers 50 - 60 kg K 50.00 per head

< 50 kg K 30.00 per head

Weaners (6-7 months) K 30.00 per head

Kids not applicable

SOURCE : D.A.L, Food Management Division, Goroka, E.H.P.

3.1.4

Sheep and Wool Sales At Village Market

White wool	K 0.50 - K 1.00 per kg
Black wool	K 2.50 - K 3.00 per kg
Ewes	K 40.00 - K 50.00 per head
Wethers	K 30.00 - K 40.00 per head

Source : D.A.L, Food Management Division, Goroka, E.H.P.

3.2

COMMERCIAL LIVESTOCK PRODUCTION

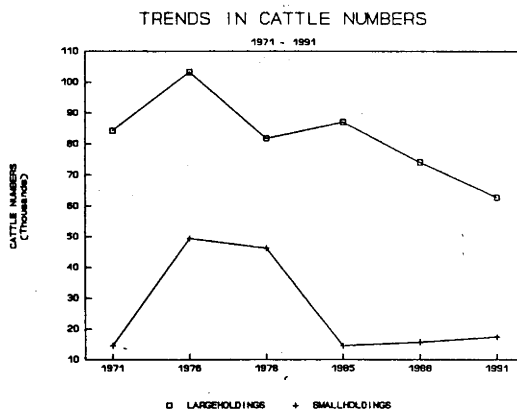
Volume of production of poultry meat, eggs, pork and beef in the country is estimated as follows :

Eggs	4 million dozen
Poultry meat	11,500 tonnes
Pork	1,650 "
Beef	2,000 "

Source : Ministerial Brief for Parliament, 1991

3.2.1

Cattle



Source : D.A.L, P.N.G Beef Cattle Sector Review, March 1991

The trend in beef cattle industry in PNG within the last two decades is shown in the graph below. Over the last fourteen years, the cattle industry has experienced two different stages. The first part was seen during the seventies when there was an increase of the beef herd to the peak of 103,299 herds for

the largeholder's and 49,463 herds for the smallholder's. The second part was experienced after the seventies when the numbers began declining to this decade; 62,797 herds for the largeholder's and 17,294 herds for the smallholder's. The downward trend is expected to continue unless the Government takes a positive approach to save the industry from total collapse. Beef production in PNG is mainly undertaken by approximately 900 smallholders and 25 mini-ranches.

3.2.2

Prices of Beef

Producer prices are negotiated periodically between producers and processors as represented by the Livestock Producers and Processors Association in Lae and the Cattlemen's Association and Butchers in Port Moresby. There is no price control on beef and pork at wholesale and retail levels. The grading system for beef is concerned only with age, fat cover, sex and the presence or absence of bruising. Weight is carcass dressed weight (CDW) in kilograms.

BEEF GRADES AND PRICES, PORT MORESBY

GRADE	DESCRIPTION	KILOGRAM	KINA(CDW)
A1	STEER/HEIFER 2 TEETH	200 - 240	2.15
A2	STEER/HEIFER 4 TEETH	220 - 240	2.05
A3	STEER/HEIFER 4 TEETH	241 - 300	1.95
B	STEER/HEIFER 4 TEETH	190 - 219	1.87
B	STEER/HEIFER 6 TEETH	230 - 320	1.87
B	STEER/HEIFER 8 TEETH	> 300	1.87
C	STEER/HEIFER 6 TEETH	200 - 229	1.70
C	STEER/HEIFER 8 TEETH	240 - 299	1.70
D	COW FULL MOUTH GOOD	230 - 270	1.40
E	STEER CULL GOOD	160 - 189	1.35
F	COW FULL MOUTH FAIR	200 - 229	1.10
H	BULLS FULL MOUTH GOOD	260 - 360	1.10
Z	COWS/BULLS	160 - 259	0.75

BEEF GRADES AND PRICES, LAE

STEERS & HEIFERS	> 200	1.75
	180 < 200	1.65
	< 180	Negotiable
COWS, YOUNG		1.20
COWS, CULL	> 200	1.10
	< 200	0.90
BULLS		1.30

Source : Papua New Guinea European Economic Community Livestock Development Corporation Future Development Study, May 1990

The prices below refer to butcher's prices, however these are also prices a farmer would receive for the sale of his livestock.

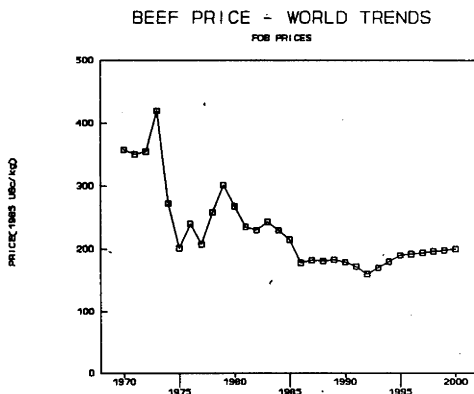
		KINA/KG
Cattle :		
Feed lot stock		2.15
Prime steers	> 200 Kg	1.87
	< 200 Kg	1.70
Cows		1.78

Source : Andersons Foodland Price Rates, Lae, 10/10/91

Bull	1.35
Feedlot : steer	1.70
heifer	1.70
Cows > 200 Kg	1.35
< 200 Kg	1.25
Heifer and steers from local farmers(non-feed lot stock)	1.65

Source : Prima Smallgoods Price Rates, Lae, 10/10/91

3.2.3 Beef Price - World Trends



Source : Lincoln University, New Zealand

- * Beef description: US Imported Frozen Boneless, 85% visible lean cow meat, f.o.b. port of entry.

The graph shows average world beef prices for 1970 to 1989 and

forecasts for 1990 to 2000. The prices are in adjusted inflation U.S cents per kilogram, based on the value of the U.S. dollar in 1985. That is, the forecast values are reported after future inflation has been removed. The forecast prices represent averages only.

3.2.4 Price of Pigs

There is no price control on pork at wholesale and retails levels and there is a ban on import of pork.

Locations	Descriptions	K/Kg
Koita Oro Boroma Pty Ltd. P.O Box 6310, Boroko, N.C.D.	Porker > 60 Kg (cw) Baconer > 60 Kg (cw) Live pigs	2.60 2.80 3.00
Radho Development Pty Ltd. P.O Box 5989, Boroko, N.C.D.	Porker (lw) Baconers (lw) Live pigs Weaners	2.65 2.65 3.00 6.00
Rumion Pty Ltd P.O Box 1922, Lae	Pork > 60 Kg(cw) Baconers < 59 Kg(cw) Live pigs	2.85 2.65 2.00
Andersons Foodland P.O Boxes 415, Lae	purchased from farmers dressed and market	2.60 2.65

Abbreviations used:-

lw : live weight

cc : carcass weight

3.2.5 Chicken

Production volumes are generally suffering due to economic pressures, with volume being down around 20 %. Price trends are highly competitive with all producers plying for trade. The price is controlled and it is very difficult to get price increases.

The egg market growth is 2 - 3 % per year. Currently the market is oversupplied. Egg prices has been static for a very long time due to poor growth and over production.

Source : * *Nhugini Tablebirds Pty Ltd, P.O Box 962, Lae.*

* *Zenag Chicken, Private Mail Bag, Zenag via Lae, Lae.*

SECTION 2

FARM EXPENDITURE

1.0 LABOUR WAGES

1.1 MINIMUM RATES OF PAY FOR CENTRES DESIGNATED

As Level 1 and Level 2 areas effective as from 1 March, 1991 following the consumer price index increase of 3 percent (3%) and retrospective to 31 December, 1990.

1.1.1 Level One Centre

ALOTAU, ARAWA, GOROKA, KAVIENG, KIETA, LAE, MADANG, MOUNT HAGEN, POPONDETTA, PORT MORESBY, RABAU, WEWAK.

Classifications	Weekly Rates (K)	Fortnightly Rates (K)
Youth Under 22 Years of Age.	29.10	58.20
General Labourers and Married Youths	58.23	116.46
Class 1	61.80	123.60
Class 2	65.80	131.68
Class 3	71.02	142.04
Class 4	77.24	154.48
Class 5		
Qualified Tradesman (B1 and B2)	83.46	166.92
Class 6		
Qualified Tradesman (A)	89.71	179.42

Working hours in the government sector is 7.3 hours per days. Weekends are rest days for most government departments, however some departments providing essential services to the public work during the weekends.

Working hours in the private sectors varies and tend to be longer than the government sector. Working days varies between 5 - 7 days.

1.1.2 Level Two Centre

BULOLO, BWAGAOIA, DARU, KAINANTU, KEREMA, LORENGAU, SAMARAI, VANIMO, WAU, MENDI, KIMBE, KUNDIAWA, WABAG.

Classifications	Weekly Rates (K)	Fortnightly Rates (K)
Youth Under 22 Years of Age.	24.57	49.14
General Labourers and Married Youths	49.14	98.28
Class 1	52.83	105.66
Class 2	57.00	114.00
Class 3	62.26	124.52
Class 4	77.24	154.48
Class 5		
Qualified Tradesman (B1 and B2)	83.46	166.92
Class 6		
Qualified Tradesman (A)	89.71	179.42

RURAL: National Minimum Wages (Rural) K21.71 per week or **K43.42 per fortnight.**

YOUTH: Junior Wages Scale was abolished on 26 June, 1986, by the Minimum Wages Board Determination No.1 of 1986. New wage for Youth which commenced 26 June, 1986 is 50% of current Level One and Level Two General Labourer's rate, paid only to those who enter employment on or after 26 June, 1986. Youth employment prior to 26 June will stay on Junior Rate until the age of 22 years. Employers employing youth groups of not less than ten youths shall negotiate the wage or wages applicable, directly with the groups.

SOURCE: Department of Labour and Employment, P.O Box 5644, Boroko, N.C.D.

1.2 VEHICLE USE

Where a worker uses his/her own motor vehicle on the employer's business, he/she shall be reimbursed an allowance at the following rate shown in the table below :

MILAGE ALLOWANCE RATES IN TOEA/KILOMETER

CLASS OF VEHICLE	ZONE 1 with 25 km of following :	ZONE 2	ZONE 3	ZONE 4
	Pt Moresby Mt Hagen Madang Goroko Lae Rabaul Kieta	Central Morobe Madang East New Britain	Eastern Highlands Northern East Sepik North Solomons West New Britain	Western Milne Bay West Sepik North Solomons Western Highlands New Ireland Southern Highlands Enga Gulf Manus Chimbu
PASSENGER VEHICLE	22.50	28.00	30.00	32.00
Four wheel drive with engine capacity over 2500 cc	not applicable rate as for passenger vehicle above.	44.00	48.00	52.00
MOTOR CYCLES	9.00	11.00	11.50	12.00

SOURCE: Dept Personnel Management General Order Book.

2.0 ELECTRICITY

2.1 ELECTRICITY COMMISSION CHARGES

First 100 units	@	11.4 t	Domestic consumers.
Balance of units	@	16.3 t	
All units consumed	@	16.3 t	Business, shops, churches and offices.

2.2 CONNECTION, RECONNECTION, TRANSFER OF SUPPLY CHARGES

Normal hours	K10.00
After hours	K20.00

2.3 TEMPORARY SUPPLY CHARGES FOR CONNECTION

Builders supply	K20.00
Others (churches, community groups)	K20.00

2.4 TARIFF RATES

NO. OF DAYS	NO. OF UNITS		TARIFF RATE	AMOUNT
7 Days	First 23 Units	@	11.4 toea-	K 2.62
	Balance	@	16.3 toea-	
14 Days	First 47 Units	@	11.4 toea-	K 5.36
	Balance	@	16.3 toea-	
21 Days	First 70 Units	@	11.4 toea-	K 7.98
	Balance	@	16.3 toea-	
30 Days	First 100 Units	@	11.4 toea-	K 11.40
	Balance	@	16.3 toea-	
37 Days	First 123 Units	@	11.4 toea-	K 14.02
	Balance	@	16.3 toea-	
44 Days	First 147 Units	@	11.4 toea-	K 16.76
	Balance	@	16.3 toea-	

NO. OF DAYS	NO. OF UNITS		TARIFF RATE	AMOUNT
51 Days	First 170 Units	@	11.4 toea-	K 19.38
	Balance	@	16.3 toea-	
60 Days	First 200 Units	@	11.4 toea-	K 22.80
	Balance	@	16.3 toea-	
67 Days	First 223 Units	@	11.4 toea-	K 25.42
	Balance	@	16.3 toea-	
74 Days	First 247 Units	@	11.4 toea-	K 28.16
	Balance	@	16.3 toea-	
81 Days	First 270 Units	@	11.4 toea-	K 30.78
	Balance	@	16.3 toea-	
90 Days	First 300 Units	@	11.4 toea-	K 34.20
	Balance	@	16.3 toea-	

EFFECTIVE 1ST SEPTEMBER 1989 FOR THE CALCULATION OF DOMESTIC ACCOUNTS ONLY BETWEEN 7 TO 90 DAYS.

SOURCE : P.N.G Electricity Commission, P.O Box 1105, Boroko, N.C.D.

3.0 FERTILISER

NAME	SIZE	SUPPLIER	PRICE, KINA
Calcium ammonium nitrate	1 mt	Hacros	382.00
Di-ammonium phosphate	1 mt	Hacros	384.75
Folifert	1 mt	Hacros	48.00
Muriate of potash	50 kg	ICI	17.00
Muriate of potash	1 mt	Hacros	306.00
Potassium nitrate	50 kg	ICI	147.40
Sodium nitrate	30 kg	ICI	63.90
Sulphate of ammonia	50 kg	ICI	17.00
Triple super phosphate	1 mt	Hacros	405.00

Abbreviation used:

MT - Metric Tonne

ICI Dulux PNG Ltd, P.O Box 230, Boroko, N.C.D

Hacros Trading Ltd, P.O Box 1657, Port Moresby, N.C.D.

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
N.P.K COMPOUND		
12.12.17 + 50 KG	1 - 19	25.20
	20 - 99	24.00
	100 - 199	22.85
	200 - 399	21.75
	400 +	20.70
13.3.20 + 4 - 50 KG	1 - 19	24.50
	20 - 99	23.35

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
	100 - 199	22.25
	200 - 399	21.15
	400 +	20.15
15.9.15 - 50 KG	1 - 19	24.00
	20 - 99	21.85
	100 - 199	20.75
	200 - 399	19.75
	400 +	18.75
15.15.6 + 4 - 50 KG	1 - 19	24.95
	20 - 99	22.70
	100 - 199	21.60
	200 - 399	20.55
	400 +	19.57
10.20.20 - 50 KG	1 - 19	24.20
	20 - 99	23.05
	100 - 199	21.95
	200 - 399	20.90
	400 +	19.90
10.25.12 - 50 KG	1 - 19	25.85
	20 +	23.50
12.12.17 + 2.5 MGO + .3B	1 - 19	25.10
	20 - 99	23.90
	100 +	22.75
BAYFOLAN - 5 LTRS	1 - 4	20.15
	5 - 19	19.20
	20 +	18.25
BAYFOLAN - 20 LTRS	1 - 4	67.60
	5 - 9	61.50
	10 +	55.90
BORATE FB 48 - 25 KGS	1 - 39	23.35
	40 - 199	21.65
	200 - 399	20.10
	400 - 699	18.80
	700 +	17.70
BORATE FB 48 - 50 KGS	1 +	42.00

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
DAP - 50 KGS	1 - 19	29.35
	20 - 99	27.05
	100 - 199	25.75
	200 - 399	24.55
	400 +	23.35
DOMOMITE - 50 KGS	1 +	12.00
FETRILON COMBI- 5 KG	1 - 3	75.75
	4+	69.00
MAGNESIUM OXIDE - 25 KGS	1 - 39	12.10
	40 +	11.05
MOP - 50 KGS	1 - 19	24.01
	20 - 99	22.87
	100 - 199	21.78
	200 - 399	20.74
	400 +	19.75
SOA - 50 KGS	1 - 19	15.20
	20 - 99	14.45
	100 - 199	13.75
	200 - 399	13.10
	400 +	12.45
SODIUM MOLYBDATE - 1 KG	1 +	10.50
NITROPHOSKA FOLIAR - 20 LTRS	1 - 4	84.00
	5 - 19	79.60
	20 +	76.00
SOLUBOR FERTILIZER - 25 KGS	1 - 39	54.75
	40 - 199	51.95
	200 - 399	48.15
	400 - 699	45.10
	700 +	42.25
SPREIGRO - 20 KGS	1 - 50	46.30
	51 - 100	44.10
	101 +	42.00

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
TSP - 50 KGS	1 - 19	26.75
	20 - 99	25.50
	100 - 199	24.25
	200 - 399	23.10
	400 +	22.00
UREA - 50 KGS	1 - 19	24.45
	20 - 99	23.25
	100 - 199	22.15
	200 - 399	21.10
	400 +	20.10
VEGETABLE FERTILIZER - 5 KGS(COFFEE FERT.)	1 +	5.00
ZINC SULPHATE - 25 KGS	1 - 39	26.45
	40 +	24.00
POT PLANT FERTILIZER	1 +	3.10

SOURCE : Farmset Limited, Box 75, Goroko, E.H.P.

3.1 SOIL, WATER, PLANT AND FEEDSTUFF TESTING

3.1.1 National Analysis Laboratory

The National Analysis Laboratory operates on a commercial basis and charges for tests it carries out in samples. The cost for each tests are shown below.

TEST	COST, KINA
WATER ANALYSIS	
pH	7.00
Conductivity	7.00
Alkalinity	7.00
Bicarbonate	5.00
Carbonate	5.00
Nitrate	10.00
Nitrite	12.00
Nitrogen	15.00

TEST	COST, KINA
SOIL ANALYSIS	
pH	same as above
Nitrogen	same as above
Phosphate	10.00
Potassium	9.00
Calcium	9.00
Magnesium	9.00
SOIL ANALYSIS	
Sodium	9.00
Cation exchange capacity 9.00 and base saturation %	
Organic matter	9.00
Sulphate	10.00
Boron	15.00
PLANT ANALYSIS	
Nitrogen	same as above
Potassium	same as above
Calcium	same as above
Magnesium	same as above
Sodium	same as above
Boron	same as above
Iron	13.00
Manganese	13.00
Zinc	13.00
Copper	13.00
FEEDSTUFF ANALYSIS	
pH	7.00
Moisture	12.00
Ash	12.00
Protein	12.00
Crude fibre	30.00
Fat	18.00
Starch	30.00
Sodium	10.00
Potassium	10.00
Calcium	10.00
Magnesium	10.00
Iron	10.00
Copper	10.00
Zinc	10.00
Lead	10.00

TEST	COST, KINA
Arsenic	24.00
Mercury	24.00
Selenium	24.00

SOURCE : National Analysis Laboratory, University of Technology, Private Mail Bag, Lae.

3.1.2 National Agricultural Chemistry Laboratory (N.A.C.L).

This laboratory is situated at the Department of Agriculture and Livestock's station at KilaKila. It provides free analytical service in soil, plant, food, natural products and feedstuff testing. The range of elements and nutrients performed by the National Analysis Laboratory (see above) can also be done by the N.A.C.L.

4.0 FREIGHT AND CARTAGE

4.1 AIR FREIGHT RATES

4.1.1 1991 Talair Air Freight Rates, Kina Per Kilogram

DESTINATIONS	RATE	DESTINATION	RATE
POM - ALOTAU	- 1.03	POM - MAPRIK	- 1.33
POM - WANIGELA	- 1.09	POM - MALALAUUA	- 0.90
POM - AITAPE	- 2.66	POM - MENDI	- 1.39
POM - AMAZON BAY	- 1.25	POM - MISIMA	- 1.58
POM - BIALA	- 1.79	POM - POPONDETTA	- 0.59
POM - BULOLO	- 0.97	POM - RABAU	- 1.91
POM - BANZ PEK	- 2.18	POM - PORGERA	- 2.09
POM - BALIMO	- 1.78	POM - ROBINSON RIVER	- 1.00
POM - CHIMBU	- 1.16	POM - SAFIA	- 0.83
POM - CAPE RODNEY	- 0.92	POM - TABUBIL	- 1.93
POM - DARU	- 1.19	POM - TARAPO	- 0.94
POM - ESA'ALA	- 1.54	POM - TUFI	- 1.10
POM - FINSCHHAFEN	- 1.67	POM - TARI	- 1.56
POM - GOROKO	- 1.17	POM - TELEFOMIN	- 2.31
POM - MT HAGEN	- 1.35	POM - KIUNGA	- 1.93
POM - HOSKINS	- 2.14	POM - VANIMO	- 2.72
POM - IHU	- 1.30	POM - WOITAPE	- 0.59
POM - KARKAR	- 1.80	POM - WAU	- 0.97
POM - KEREMA	- 1.15	POM - WEWAK	- 1.84
POM - KIKORI	- 1.87	POM - NADZAB	- 0.97
POM - KUPIANO	- 0.71	POM - BAIMURU	- 1.64
POM - LABLAB	- 1.88	POM - LOSUIA	- 2.00
POM - MADANG	- 1.32		

Basic charge for air freighting a cargo is K10.00.

POM - Port Moresby.

Air Niugini Domestic Air Cargo Rates, Kina/kg

Basic charge per shipment = K 10.00

Quantity discounts	100 - 249 Kg	5 %
	250 - 499 Kg	10 %
	> 500 Kg	15 %

[illegible]

4.2 LAND FREIGHT RATES

4.2.1 Rates for Different Sizes of Container

Locations	Town	Hohola	Tokarara	17 Mile
	Gordons	7 Mile		
		Gerehu		

1. Small, 4m	K 60.00	K 70.00	K 80.00	K 140.00
2. Medium, 9m	K 70.00	K 80.00	K 100.00	K 150.00
3. Big, 20m	K 110.00	K 140.00	K 160.00	K 180.00

- * Loose Cargoes(not in containers) - K 12.50 per metre or tonnage.
- * Port Moresby transport does not service other Provinces in PNG.

Source: Port Moresby Transport Pty Ltd.

4.3 SEAFREIGHT RATES

4.3.1 Domestic Seafreight Tariff List

CARGO CLASSIFICATION	UNIT	AREA CODE				
		1	2	3	4	5
BASIC VILLAGE FOODS	M ³	33.80	39.00	42.90	46.80	52.00
	T	35.10	40.30	42.90	48.10	52.00
AGRICULTURE PRODUCE	M ³	36.40	41.60	45.50	49.40	54.60
EMPTIES + EMPTY RETURNS	T	37.70	41.60	46.80	50.70	54.60
GENERAL CARGOES	M ³	46.80	52.00	55.90	59.80	63.70
	T	49.40	54.60	58.50	62.40	66.30
HAZARDOUS +	M ³	57.20	62.40	66.30	70.20	74.10
OBNOXIOUS CARGO	T	58.50	62.40	66.30	71.50	75.40
MOTOR VEHICLES+ UPTO	10M ³	393.90	429.00	469.30	496.60	535.60
	+ UPTO 15M ³	603.20	656.50	709.80	770.90	817.70
REFRIGERATED CARGO	T	153.40	157.30	162.50	166.40	170.30
BULK CARGO	OPEN RATES					

Transshipment Cargo

Add K3.90 per revenue tonne for transshipment of cargo at Lae and Port Moresby which covers road transport to second carrier.

+FLAT RATES: Motor vehicles over 15m³ to be calculated at category 3.
The above rates include Bunker Surcharge at 1st January, 1985.

AREA CODE 1 - Samarai, Alotau. AREA CODE 4 - Kimbe, Kavieng.
AREA CODE 2 - Oro bay, Popondetta. AREA CODE 5 - Wewak, Aitape.
AREA CODE 3 - Lae, Rabaul, Kieta.

The recommended maximum tariff came into force on 1st January, 1991.

SOURCE: Airtrade, P.O Box 7252, Boroko, N.C.D.

5.0 SEEDS AND PLANTS

5.1 CASH CROP SEEDLINGS

5.1.2 Cocoa Seeds

SG2 Seedlings	10t - 25t
Clone Seedlings	25t

SOURCE: L.A.E.S, Keravat.

5.1.3 Oil Palm Seeds

(a) West New Britain

Untreated seeds	30t - 48t
Treated seeds	40t - 48t
Germinated seeds	40t - 50t

(b) New Ireland

Seeds	K1.80
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SOURCE: West New Britain Oil Palm

5.1.4 Coconut Seeds

- (a) Rate for Plantation 30t (plus polybag)
- (b) Rate for smallholder 20t (plus polybag)
- (c) Cost of seedlings 50t each
ex-DAL nurseries
(orders up to 500)

SOURCE: S.C.C.R.E.P, D.A.L.

5.1.5 Rubber Seeds

- (a) 25t/kg of seeds
- (b) 70t/polybag from nurseries.

SOURCE: Rubber Section, Konedobu.

5.1.6 Cardamom and Pyrethrum Seeds

D.P.I distribute the seeds free of charge to smallholders in the highlands.

SOURCE : D.A.L, Goroko.

5.1.7 Coffee Seedlings

(a) K5.00/kg. One kilogram contains 1,000 to 2,000 seeds.

SOURCE : Coffee Research Institute, Goroko.

5.2 VEGETABLE SEEDS

H = Highland

L = Lowland

SEEDS		SIZE	PRICE, KINA
BEAN			
Blue Lake (clb)	H	50g	0.95
Brown Beauty (Dwarf)	L	50g	0.95
Contender (Dwarf)	H	900g	6.12
Early Long Pod (Broad)	H	500g	3.98
Epicure (Clb)	L	50g	0.95
Long John (Dwarf)	L	900g	8.45
Pioneer (Dwarf)	L	50g	0.95
Purple King (Clb)	L/H	50g	0.95
Snap (Dwarf)	L	50g	0.95
Snake (Clb)	L	50g	0.95
Snake Yard Long (Clb)	L	900g	11.40
Tender Green (Dwarf)	H	900g	6.45
BEET ROT			
Yates Derwent Globe Rubbed & Graded	H	100g	3.72
Yates Early Wonder Rubbed & Graded	H	100g	2.32
BEET SILVER			
Fordhook Dark Green	L/H	100g	4.05
BROCCOLI			
Green Duke Hybrid	H	100g	42.57
Fordhook Early	H	100g	37.28
Fordhook Late	H	25g	8.80
BRUSSEL SPROUTS			
Emerald Ball	H	100g	3.20

SEEDS		SIZE	PRICE, KINA
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CABBAGE

Chinese Chi Hi Li	L	100g	3.96
Chinese Pak Choi	L	100g	3.25
Chinese Saladeer	L/H	100g	16.90
Chinese Wong Bok	L/H	100g	5.30
Express Cross 60	H	100g	41.33
K.K Cross Takii	L	100g	41.99
K.Y Cross	H	100g	41.99
Y.R Summer Cross	L/H	100g	22.56
Nagaoka Tropicana	L	100g	16.76
Tropicross Hybrid	H	100g	14.15

CAULIFLOWER

Snow Green	H	100g	49.67
Phenomenal - 4M Y404	H	100g	6.40

CAPSICUM

California Wonder	L	100g	13.99
Yolo Wonder B.	L	100g	13.99

CARROT

Chantenay Royal Long	H	100g	5.25
New Kuroda	L/H	100g	4.51
Red Cored	H	100g	5.25
Top Weight Raiser Strain	H	100g	7.70

CORN

Honey Sweet	L/H	100g	3.11
Terific	L/H	500g	4.45
Skyliner	L/H	100g	2.99

CUCUMBER

Green Gem	L/H	100g	4.15
Money Maker	L/H	100g	5.04
Southern Delight	L/H	20g	7.20
Supermarket	L/H	25g	3.57

SEEDS		SIZE	PRICE, KINA
EGG PLANT			
Black Beauty	L/H	100g	5.25
Early Long Purple	L	100g	6.88
Millionaire	L/H	25g	7.7
LEEK			
Meusselburgh	H	100g	3.48
LETTUCE			
Great Lake Regular	H	100g	8.55
Minetto	L/H	100g	9.25
Mignonette	L/H	25g	3.89
Yatesdale	H	100g	7.48
MARROW			
Blackjack Hybrid	L/H	100g	10.66
MELON			
Dixie Jumbo	L/H	25g	7.95
Hales PMR 45	L/H	25g	2.70
Hales 936	L/H	25g	1.17
OKRA			
Clemson Spineless	L/H	100g	2.16
ONION			
Tropic Ace (Takii)	L/H	25g	6.99
Superex	L/H		2.14
Bunching Onion	L/H	25g	1.21
PEAS			
Green Feast	H	50g	0.50
Telephone (Clb)	H	50g	0.50
Sugar Snap (Dwarf)	H	50g	0.50
Sugar Snap (Clb)	H	50g	0.50

SEEDS		SIZE	PRICE, KINA
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PUMPKIN

Queensland Blue	H	100g	4.36
Whangaparaoa Crown	H	100g	3.20

RADISH

French Breakfast	H	100g	2.95
Long White Chinese Tropical	L	25g	2.37
Sparkler	L/H	100g	1.53
White Icicle	H	25g	2.89
Minoase Hybrid #2	L/H	25g	3.25

SQUASH

Waltham Butternut	H	25g	3.39
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SPINACH

Alrite	L/H	100g	3.05
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TOMATO

Bonanza	L/H	25g	31.57
Fireball	L/H	100g	15.35
Grosse Lisse - Improved	L/H	100g	19.25
Pinkii	L/H	25g	31.57
Tiny Tim	L/H	25g	4.76
Roma Egg	H	100g	9.69
Money Maker		25g	5.59
Tropic VF		25g	6.25

TURNIP

White Globe Purple Top	H	100g	2.05
Whitestone/Showball		100g	3.61

WATERMELON

All Sweet	L	100g	17.16
Sugar Baby	L	100g	4.85
Candy Red	L	100g	5.39
Sweet Dragon	L/H	10g	4.03
Sweet Marvel		25g	8.39
Yellow Baby Seedless	L/H	10g	18.17

SEEDS**SIZE****PRICE, KINA**

ZUCCHINI**Black Jack Hybrid****H****100g****10.66****Long Green Bush****H****100g**

SOURCE: Brian Bell & Company Pty.Ltd, P O Box 1228, Boroko, N.C.D.

6.0 AGRICULTURAL CHEMICALS

TRADE NAME	CHEMICAL	SUPPLIER	PRICE, KINA
Anvil, 200 ml	Fungicide	ICI	12.60
Anvil, 1 L	Fungicide	ICI	33.60
Anvil, + 500 ml	Fungicide	ICI	36.75
Anvil	Fungicide	Farmset	26.00 per litre
Atrazine 50 flowable	Fungicide	ICI	132.30
Atrazine W.P	Fungicide	ICI	86.50
Bayfidan 250 EC	Fungicide	Hacros	42.97 per litre
Champ flowable	Fungicide	ICI	45.80
Copper nordex	Fungicide	Farmset	3.15 per kg
Copper oxychloride 25 kg	Fungicide	ICI	71.40
Copper sandoz	Fungicide	Hacros	84.00 per kg
Kocide	Fungicide	Hacros	58.68 per kg
Tilt 250 EC	Fungicide	Hacros	44.40 per litre
Ametrex 50 SC	Herbicide	Farmset	6.30 per litre
Amoxone, 20L	Herbicide	ICI	94.00
Bravo 500, 5L	Herbicide	ICI	75.60
Butoxone 45, 5L	Herbicide	ICI	88.25
DDT 25 M.O, 20L	Herbicide	ICI	71.40
Dipterex, 5L	Herbicide	ICI	71.30

TRADE NAME	CHEMICAL	SUPPLIER	PRICE, KINA
Fusilade, 5L	Herbicide	ICI	110.00
Glyphosate	Herbicide	Farmset	13.50 per litre
Gramoxone	Herbicide	Farmset	4.60 per litre
Paracol, 5L	Herbicide	ICI	48.99
Round-up, 20L	Herbicide	ICI	408.00
Simazlne	Herbicide	Farmset	5.70 per litre
Stomp, 20L	Herbicide	ICI	172.00
24-D amine	Herbicide	Hacros	3.50 per litre
Anuron	Herbicide	Hacros	5.90 per litre
Gramoxone	Herbicide	Hacros	4.25 per litre
MCPA	Herbicide	Hacros	3.70 per litre
MSMA	Herbicide	Hacros	3.60 per litre
Round up	Herbicide	Hacros	9.42 per litre
Simazine 500 FW	Herbicide	Hacros	3.25 per litre
Abate, 25 kg	Insecticide	ICI	113.60
Acetellic smoke generator	Insecticide	ICI	7.40
Actellic	Insecticide	Farmset	37.70 per litre
Actellic 50 EC	Insecticide	ICI	33.00
Atabron, 1L	Insecticide	ICI	63.00
Auto drencher	Insecticide	ICI	116.23
Bugmaster	Insecticide	Hacros	9.90 per kg

TRADE NAME	CHEMICAL	SUPPLIER	PRICE, KINA
Dead end mats	Insecticide	ICI	5.80
Detia tabs	Insecticide	ICI	94.50
Dowfume 680G	Insecticide	ICI	10.30
Gamaphex, 20L	Insecticide	ICI	112.00
Grenada, 1L	Insecticide	ICI	214.00
Hacros wetta	Insecticide	Hacros	0.78 per litre
Heptachlor 400 EC	Insecticide	ICI	269.00
Karate	Insecticide	Hacros	28.00 per litre
Karate	Insecticide	Farmset	32.00 per litre
Karate, 1L	Insecticide	ICI	10.30
Lindane granules 25 kg	Insecticide	ICI	55.50
Lorsban	Insecticide	Hacros	16.03 per litre
Malathion, 20L	Insecticide	ICI	114.00
Malathion	Insecticide	Farmset	5.15 per litre
Malawash, 5L	Insecticide	ICI	39.20
Maldison	Insecticide	Hacros	4.80 per litre
Nilverm injection 1 L	Insecticide	ICI	56.40
Nilverm pig & poultry, 2.5L	Insecticide	ICI	48.80
Orthene, 20g	Insecticide	ICI	1.60
Permethrin 25 EC 25 L	Insecticide	ICI	735.00

TRADE NAME	CHEMICAL	SUPPLIER	PRICE, KINA
Pig wormer granules, 1kg	Insecticide	ICI	91.00
White oil DC tron	Insecticide	Hacros	1.50 per litre

SOURCES: *ICI Dulux PNG Ltd, P.O Box 230, Boroko, N.C.D.*
 Hacros Trading Ltd, P.O Box 1657, Port Moresby.
 Farmset Ltd, P.O Box 75, Goroko, E.H.P.

7.1 MAXIMUM PRICES FOR PETROL, DISTILLATE AND KEROSENE FOR GOVERNMENT PURCHASE FROM OIL COMPANIES AND THEIR AGENTS

The prices shown below are the maximum prices payable for government purchases at the centres listed. The prices for any locality which does not appear in the list should be calculated from the prices of the nearest locality listed. All purchases are to be made from the following oil companies: Shell PNG Pty Ltd, Mobil Oil Ltd, B.P PNG Pty Ltd or their nearest agents. Drum purchases are to be made on a drum exchange basis only.

Notes for Guidance:

1. The prices are to become effective from 8th August 1991
2. The prices must not be exceeded
3. Where the Oil Companies are unwilling to supply at the negotiated prices, the circumstances surrounding the refusal to supply must be reported to the Deputy Price Controller who will arrange for the matter to be investigated with Oil Company representatives.
4. Any variation in the price structure must be notified by post or telegraph to the relevant officer of the Department of Finance and Planning and that officer will advise all the Departments concerned, and acknowledge receipt of the variation advices.
5. Purchases of fuel will be made on a 200 litre drum exchange basis only Where bulk fuel is not available.
6. Should a Company or its agents be unable to supply the Government (volume and/or price), purchases will be made from the cheapest alternative source with prior advice being made to the Deputy Controller and written approval obtained.
7. Deposit on Returnable Drums: Deposit on returnable drums is K45.00 per Drum.

Location	Motor Spirit Government purchase price. toea/litre.	Distillate Government purchase price. toea/litre.	Kerosine Government purchase price. toea/litre.
Port Moresby	49.1	34.3	38.8
Rabaul	49.1	34.3	38.8
Wewak-bulk	52.50	37.3	41.90
Wewak-drum	67.50	49.2	53.70
Goroka	53.0	38.6	42.7
Wabag	60.1	46.0	49.8
Kerema	63.7	46.3	50.8
Madang	49.1	34.30	38.8
Lorengau-bulk	52.50	37.30	0
Lorengau-drum	68.20	49.80	54.30
Samarai-bulk	0	37.50	0
Samarai-drum	67.40	49.30	53.80
Lae	49.10	34.30	38.80
Kavieng-bulk	52.30	37.10	0
Kavieng-drum	66.40	48.30	52.80
Kieta	50.10	35.30	39.80
Popondetta-bulk	0	41.3	0
Popondetta-drum	66.80	50.80	55.30
Kundiawa	54.80	40.50	44.50
Mendi	62.70	49.30	52.40
Kimbe-bulk	52.30	37.20	41.20
Kimbe-drum	64.10	48.10	52.60

Location	Motor Spirit Government purchase price. toea/litre.	Distillate Government purchase price. toea/litre.	Kerosine Government purchase price. toea/litre.
Aitape-bulk	0	46.70	0
Aitape-drum	64.80	46.70	51.20
Mt Hagen	56.40	42.30	46.10
Daru-bulk	0	38.30	0
Daru-drum	68.10	51.10	55.60

SOURCE: Dept of Finance and Planning, Post Office, Wards Strip, Waigani.

7.2 REGISTRATION/LICENCING/ROAD CHARGES

ITEM	DESCRIPTION	FEE
1.	Learner's Permit under Regulation Section 3(1)	K10.00
2.	Driving Licence or renewal of driving licence.	K10.00
3.	Fee for a permit or renewal of a permit to drive a public motor vehicle under Section 33.	K44.00
4.	In the places to which this item applies - licence or renewal of a licence to drive a motor vehicle.	K30.00
5.	Provisional licence to drive.	K9.00
6.	Registration or renewal of registration of a motor car with an engine size:-	
	not exceeding 1300cm3 (c.c.)	K88.00
	exceeding 1300 cm3 (c.c.) but not exceeding 2000 cm3 (c.c.)	K103.00
	exceeding 2000 cm3 (c.c.) but not exceeding 4000 cm3 (c.c.)	K147.00
	exceeding 4000 cm3 (c.c.)	K250.00

ITEM	DESCRIPTION	FEE
7.	Registration or renewal of registration of commercial vehicle (other than motor cars, motor cycles, trailers or motor tractors not used solely for domestic purposes), where the gross weight:-	
	Does not exceed 1 tonne	K90.00
	Exceeds 1.0 tonne but does not exceed 2.0 tonne	K103.00
	Exceeds 2 tonne but does not exceed 3 tonne	K125.00
	Exceeds 3 tonne but does not exceed 6 tonne	K150.00
	Exceeds 6 tonne but does not exceed 8 tonne	K180.00
	Exceeds 8 tonne but does not exceed 10 tonne	K200.00
	and in addition, and in where gross weight exceeds 10 tonne for each tonne or part thereof a tonne in excess of 10 tonnes.	K25.00
8.	Registration or renewal of registration of a motor cycle:- without side car.	K30.00
9.	Registration or renewal of registration of trailer used solely for domestic purposes and of a caravan:-	
	Where body length -	
	Does not exceed 2m	K8.00
	Exceeds 2m but does not exceed 4m	K29.00
	Exceeds 4m	K44.00
10.	Registration or renewal of registration of trailer (other than a trailer used solely for domestic purposes), for every tonne or part thereof of gross weight.	K20.00
11.	Registration or renewal of registration of motor tractor with an engine size:-	
	Not exceeding 2500cm ³ (c.c.)	K30.00
	Exceeding 2500cm ³ (c.c.) but not exceeding 6000 cm ³ (c.c.)	K36.00
	Exceeding 6000 cm ³ (c.c.)	K46.00
	Tractors having other than pneumatic tyres shall bear a surcharge in addition to the above fees, of one-half of the relevant fee.	

ITEM	DESCRIPTION	FEE
12.	Registration or renewal of registration of a forklift, crane, front end loader, grader or other implement not elsewhere specified.	K36.00
13.	Certificate of registration as motor omnibus:-	
	(a) where the omnibus may lawfully carry up to 20 passenger (exclusive of the driver).	K10.00
	(b) in other cases	K20.00

SOURCE : Dept Transport, P.O Box 457, Konedobu, N.C.D

7.3 TRACTOR

7.3.1 Dunlop Tractor Tyres

SIZE	FRONT TYRE	REAR TYRE
7.5 X 16	K215.15	K215.15
10.5 X 20	K943.65	K943.65

7.3.2 Dunlop Tractor Tubes

SIZE	FRONT AND REAR
7.5 X 16	K28.00
10.5 X 20	K24.00

A discount rate of 35 % is given for purchase of above items.

SOURCE : Dunlop PNG Pty Ltd, P.O Box 6202, Boroko, N.C.D.

8.0 PROFESSIONAL FEES

8.1 REAL ESTATES

8.1.1 Sale Commissions

The following are the rates of commissions for sale of property at the stated value;

- 5% for first K100,000 or part thereof.
- 3.5% of second K100,000 or part thereof.
- 3.0 % of third K100,000 or part thereof.
- 2.5 % of fourth K100,000 or part thereof.

8.1.2 Valuation Fees

	AMOUNT	FEE minimum fee K150.00
Basic scale	K20,000	K200.00
	K30,000	K240.00
	K40,000	K280.00
	K50,000	K320.00
	K100,000	K480.00
	K200,000	K730.00
	K300,000	K955.00
	K400,000	K1,355.00
	K1,000,000	K2,355.00
	K2,000,000	K4,105.00

8.1.3 Auction Fees

Government rate is K1,500 per auction.

8.1.4 Land Transfer Fees

Lodgement fee to Dept Lands	K50.00
Lawyers fees varieS	K400.00 - K600.00
Stamp duty to Tax Office	K25,000 - 2 %
	K50,000 - 3 %
	K100,000 - 4 %
	Over - 5 %

SOURCE : The Professionals, P.O Box 635, Port Moresby, N.C.D.

8.2 LEGAL FEES

8.2.1 J.F. Aisa and Associates Lawyers

A deposit of K200.00 is required from client.

National Court Rate - K400.00 per hour.

District Court Rate - K200.00 per hour.

Amount charged depends on work required, time and nature of work.

More than K200 per hour is charged for land disputes. Government and acquired land court cases also bear similar costs.

Work can be done on an ad hoc or retainership basis.

8.2.2 Warner Shand Lawyers

The rate for court attendance is K200.00 per hour. Deposits must be paid in advance.

8.3 CONSULTANCY CHARGES

(1) Senior Agricultural Management Consultant.

Local Based

Charge out rate : K550 per day plus local accommodation and fares if applicable.

Approx. hectares per day (including reporting time)

Oil Palm	500
Rubber	300
Cocoa	200
Coffee	150

(2) Overseas Based Senior Consultant.

Charge out rate : K400 per day plus overseas fares, plus local accommodation and fares.

Approx. hectares per day : as above.

(3) Agronomic Advice only (Overseas Consultant)

Charge out rate : K400 per day plus overseas fares
and local expenses.

Approx. hectares per day:

Oil Palm	1000
Rubber	1000
Cocoa	500
Coffee	400

(4) Economist (Overseas)

Charge out rate : K450 per day.

For practical purposes in a well run largeholder set up provide for two
Inspection and Advisory visits (VA) and agronomy visit per year:

Cost per Ha including expenses:

Oil Palm	K3.50
Rubber	K5.66
Cocoa	K8.5
Coffee	K11.33

SOURCE: Kina Gilbanks & Co. Pty Ltd, P.O Box 1131, Rabaul.

9.0 ADMINISTRATION EXPENSES

9.1 TELEPHONE AND TOLL CHARGES

Installation of phone in business houses

Bond fee	K140
Installation	K50
1 month rent in advance	<u>K 10</u>
Total	K200

Installation of phone in residential houses

Bond fee	K40
Installation	K50
1 month rent in advance	<u>K10</u>
Total	K100

Toll charges - refer to PTC telephone directory.

9.1.1 Postage

TYPES OF SERVICE KINA

Post Office Box

Small	6.60
Medium	13.20
Large	19.80

Other Fees

Additional keys	1.00
Transfer (Boxes and Bags)	1.00
Private Bag service per annum	12.00
Locked bag service per annum	48.03

9.1.2 Domestic Postal Service

CATEGORY	WEIGHT	AIRMAIL	SURFACE MAIL
		KINA	KINA
Letters (Max 500g and packets)	up to 050g	0.21	0.21
	51 up to 150g	0.50	0.40
	151 up to 250g	0.85	0.70
	251 up to 500g	1.70	1.40

CATEGORY	WEIGHT	AIRMAIL KINA	SURFACE MAIL KINA
Parcels (Max 25 kg)	up to 1 kg	5.00	4.00
	over		
	1 up to 2kg	6.25	4.25
	2 up to 3 kg	7.50	4.50
	3 up to 4 kg	8.75	4.75
	4 up to 5 kg	10.00	5.00
	5 up to 6 kg	11.25	5.25
	6 up to 7 kg	12.50	5.50
	7 up to 8 kg	13.75	5.75
	8 up to 9 kg	15.00	6.00
	9 up to 10 kg	16.25	6.25
	10 up to 11 kg	17.25	6.50
	11 up to 12 kg	18.25	6.75
	12 up to 13 kg	19.25	7.00
	13 up to 14 kg	20.25	7.25
	14 up to 15 kg	21.25	7.50
	15 up to 16 kg	22.25	7.75
	16 up to 17 kg	23.25	8.00
	17 up to 18 kg	24.25	8.25
	18 up to 19 kg	25.25	8.50
	19 up to 20 kg	26.25	8.75
	Each additional kg	1.00	0.25

SOURCE : Post & Telecommunication Corporation, P.O Box 1349, Boroko, N.C.D.

10.0 FENCING COSTS

10.1 FENCING MATERIAL

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
BARBED WIRE 1.6 MM - 400 M	1 - 4	50.50
	5 +	45.90
BARBED WIRE 2.0 MM - 400 M	1 - 4	72.00
	5 +	65.50
BOUNDARY FENCE - ROLL	1 +	98.00
CHICKEN WIRE 13/55/900 - ROLL 50 M	1 +	91.00
FENCING CLIPS	1 +	1.90
FENCING CLIPS - 25 KGS	1 +	38.00
FENCING PLIERS	1 +	17.00
FENCING WIRE 1.6 MT (H.T. - 25 KGS)	1 +	58.00
FENCING WIRE 4 MM - 25 KGS	1 - 4	47.00
	5 +	43.40
PIG WIRE NO. 6	1 - 4	48.00
	5 +	45.00
PIG WIRE NO. 8	1 - 4	57.00
	5 +	55.00
PIG WIRE NO. 12	1 - 4	93.00
	5 +	90.00
POST DRIVER LARGE	1 +	75.50
REEL - HAYES	1 +	48.75
RING FASTENER GUN GIRARD	1 +	40.00
RING FASTENERS (STAPLES) 1 BOX/1000	1 +	8.40

ITEM/DESCRIPTION	QUANTITY	PRICE, KINA
STAPLES FENCING - 1 KG	1 +	3.40
STAPLES SLICE POINT - 25 KGS	1 +	62.50
STAR PICKETS - EA 5FT/1500	1 - 9 10 +	4.80 4.00
STAR PICKETS - EA 6FT/1800	1 - 9 10 +	5.45 4.95
STAR PICKETS - EA 7FT/2100	1 - 9 10 +	6.30 5.70
STAR PICKETS - EA 8FT/2400	1 - 9 10 +	7.45 6.75
TIE WIRE 2 MM - 1 KG	1 +	2.65
TIE WIRE 2 MM - 5 KGS	1 +	11.26
WIRE STRAINER HAYES	1 +	43.05
WIRE STRAINER TIGHTENING HANDLE	1 +	4.00
WIRE STRAINER PERMANENT	1 +	2.05
WOODEN POST	1 +	5.00

SOURCE : Farmset Ltd, P.O Box 75, Goroko, E.H.P

10.2 A.R.C TITAN MATERIAL

PRODUCT	WEIGHT, KG	PRICE, KINA
MESH		
Weldmesh galvanized rolls		
Copra mesh, 50m x 0.9m	126.00	444.99
Handyman packs, 4m x 0.9m	2.50	18.29

PRODUCT	WEIGHT, KG	PRICE, KINA
Weldmesh galvanised sheets	11.00 - 36.00	23.45 - 152.01
Bright sheets, 3m x 2.3m	23.00	29.30
Chainmesh heavy galvanized 15m x 1.8m	63.00	139.34
RURAL FENCING		
Star Steel Fence Posts		
1200mm Bundle of 10	24.00	32.03
1800mm Bundle of 10	36.00	48.05
2400mm Bundle of 10	48.00	64.05
Hinge joint fence		
6 line 700mm x 50m	25.00	40.95
8 line 800mm x 50m	33.00	53.94
Galvanised fencing wire		
1.60 x 3100m	50.00	120.11
1.60 x 1550m	25.00	60.05
Galvanised tie wire		
1.25 x 103m	1.00	2.73
1.25 x 515m	5.00	11.99
1.25 x 1030m	10.00	27.27
Reinforcing Steel - Plain Bar		
6m	1000	1203.00
10m	1000	1203.00
4m	1.10	1.31
6m	15.17	18.56

10.3 ANIMAL FENCING COSTS

10.3.1 Sheep Fencing Cost

1. Boundary Fencing or Internal Fencing

7 strand galvanised wire
Posts every 5 metres

Droppers and tie-wire between posts

Costs per kilometre

Per Km Total

a)	200 hardwood bush posts @ K1.00	200.00
b)	Dropper, 5 per post (every 1m): 1000 @ K0.16	160.00
c)	One gate every kilometre @	100.00
d)	7000 metres galvanised wire	
	<u>7000m</u>	
	800m/roll = 8.75 rolls @ K158/roll	1,382.00
e)	Tie wire, staples, bolts, etc.	<u>50.00</u>
		K1892.00 per km

Area required by 1850 sheep stock units or per 1000 commercial breeding ewes:-

Assume 10 ssu per hectare (improved) = 185 ha, total area fenced 200 ha.

Area: 2 km x 1 km = 200 hectares (rectangular)

Assume 12 paddocks thus:-

1	2	3	4	5	6	1 km (1000m)
7	8	9	10	11	12	

2 km (2000m)

Total Fencing

7 lengths of 1 km = 7 km

3 lengths of 2 km = 6 km

13 km total

13 km @ K1,892 =K24,596

or K123 per fenced hectare (exclusive of water points)

Note: Savings may be made in internal fencing costs by using lighter materials, reducing strands of wire to 5 for internal fencing, or by using internal electric fencing.

2. Smallholder Night Paddock

(i) Square Paddock:-

1 hectare fenced (10,000m²)

100m x 100m or 400m of fencing, Bush materials gate.

Material Costs:

Kina

- | | | |
|----|---|--|
| a) | 2 strands galvanised or barbed wire = 800m | 158.00 |
| b) | Square mesh pigwire, 6 line,
<u>400</u>
50m = 8 rolls of 50m @ K40.95 | 328.00 |
| c) | Local posts, hardwood, 3 metres apart
133 posts @ K1.00 | 133.00 |
| d) | Staples, tie-wire and nails | <u>60.00</u>
K679.00 per 1ha
paddock |
- or K1,697 per km

(ii) Rectangular Paddock:- (1 Ha)

150m x 67m = 434m fencing
Cost = K679 x 434m
400m = K737.00

10.3.2 Cattle Fencing Cost (Beef)

Assume: 1 cattle beast per 2 ha - unimproved
1 cattle beast per 2 ha - improved

20 breeding cows with followers equivalent to 36 cattle stock units (refer: smallholder cattle model budget).

(i) Unimproved

1 csu/2 ha
20 breeding cow unit requires 72 hectares

- Assume rectangular paddock boundary fence
1000m x 720m = 72 hectares fenced
- Assume 4 internal paddocks (natural water supply)

Materials required Total 3 Strand
fence (metres)

Boundary (1000m + 720m) x 2	3440m	10,320
Internal (1000m + 720m) =	<u>1720m</u>	<u>5,160</u>
	5160m	15,480
	fencing	metres fencing
	metres	wire

eg:

	1000m		
720m	1	2	(Not to Scale)
	3	4	

Kina Total

- a) 3 strands barbed wire:
15,480m: requires 39 x 400m rolls @ K70 each 2730
- b) Hardwood posts 200 per km fencing
5.16 km x 200 = 1032 posts @ K1.50 each K1,548
- c) Gates: 5 @ K100 500
- d) Staples and nails 360
K5,138

or K996 per km
or K72 per ha fenced

(ii) Improved 1 csu per hectare requires 36 ha for 20 breeding cow model

Fence Materials:

Boundary (720m + 500m) x 2 = 2440m
Internal (720m + 500m) = 1220m
3660m
metres
fencing

	720m		
500m	1	2	(Not to Scale)
	3	4	

or $\frac{3660}{5160} \times 100 = 71\%$ of cost of example (i) above (unimproved pasture)

K5138
less 500 gates
~~K4638~~ for 5160 metres {example (i)}
x 0.71 = K3293
+ 500 for gates
K3793 total for 36 ha or K1036 per km or K105 per ha
fenced

11.0 FARM MACHINERY AND EQUIPMENT COSTS

11.1 TRACTORS

MODEL	SPECIFICATION	DESCRIPTION	PRICE, KINA
T2600	DAEDONG 26 HP	4WD with all weights and accesories	10,500.00
D140/DT100	DAEDONG 14 HP	2 wheel drive unit only	2,995.00
		drive unit and rotary	3,485.00
		drive unit and trailer	3,800.00
	ACCESORIES R60	rotary only	550.00
	P30	plow	140.00
	T10.00	one ton trailer	850.00
	T05.00	half ton trailer	600.00
		ridger	50.00
CARRARO	5500	Tractor	18,800.00
	5500	Transporter	16,000.00
	7700	Tractor	24,000.00
SIBAURA		25 HP	10,000.00
		33 HP	11,250.00
DONGFENG		Plough and cultivator	3,500.00

11.1.1 Attachments and Implements

Manufacture	Tractors	Attachments & Implements	Price, Kina
GALLAGHER	A1502	Shakerator	3,250.00
	A1101	Rotary hoe 30" 15 - 25 HP	1,700.00
	A1102	Rotary hoe 40" 20 - 30 HP	1,800.00
	A1213	Rotodisc 60" LD 40 - 60 HP	4,500.00
	A1321	Rotodisc 60" HD 50 - 80 HP	5,800.00
BONEL		Grader blade	895.00
		14 disc harrow	2,150.00
		16 disc harrow	2,500.00

Manufacture	Tractors	Attachments & Implements	Price, Kina
MASTER	VS56	Winch 5 ton	1,958.00
GASPADO		2 row planter and fertiliser	1,850.00
		4 row planter and fertiliser	3,950.00
UDOR	Kappa 40	Spray pump PTO	285.00
	Alpha 65	Spray pump PTO	550.00
	Kappa 75	Spray pump PTO	550.00
	Sigma 100	Spray pump PTO	700.00
		400 litre tank	600.00

SOURCE: South Pacific Machinery Pty Ltd, P.O BOX 1322, Boroko, N.C.D.

11.2 MACHINERY

DESCRIPTION	QUANTITY	KINA
HAND PULPER	1 - 19	325.00
	20 +	290.00
BRUSH CUTTER	1 +	340.00
CHAIN SHARPENING JIG (STIHL)	1+	37.55
CHAIN SAW STIHL - 056	1 +	875.00
CHAIN SAW STIHL - 085	1 +	715.00
CHAIN SAW STIHL - 009	1 +	290.00
CP3 SPRAYER	1 - 19	27.00
	20 +	117.00
CP15 SPRAYER	1 - 19	97.00
	20 +	87.00
CROPLINER 700 SPRAYER	1 +	5,176.50
FALCON 10 SPRAYER	1 +	176.00

DESCRIPTION	QUANTITY	KINA
FILESAW - STIHL SAW	1 +	2.45
FYN SPRAYERS OR MASTER	1+	48.25
FYN SPRAYERS - 1.5 LT	1 +	35.00
CAPACITY		
GUIDE BARS 2"/525 MM	1 +	47.30
JOHN GORDON PULPER 3 DISC WITH SIEVE	1 +	15,300.00
JOHN GORDON PULPER 4 DISC WITH SIEVE	1 +	17,970.00
MICRO MASTER SPRAYER	1 +	647.00
MOTORISED KIVU COFFEE PUMP	1 +	3,820.00
AH4 HULLER	1 +	3,228.00
MIST BLOWER - MD300	1 - 9	375.00
	10 +	365.00
MOTORISED KNAPSACK MS045	1 - 9	415.00
	10 +	375.00
NEWLONG SEWING MACHINE	1 +	935.00
TURBAIR WEEDER	1 +	94.00
TWO STROKE OIL - 1 LTR	1 +	4.00
MACHINE OIL - 100 MLS	1 +	5.60
HANDIMAN OIL - 3 FLUID	1 +	2.00
KIVU COFFEE PUMP	1 +	4,166.00
WHEELBARROW	1 +	49.50

SOURCE: Farmset Limited, P.O Box 75, Goroka.

11.3 COCOA TOOLS

DESCRIPTION/ITEM	PRICE, KINA
COCOA HARVESTING HOOKS	2.25
POLE PRUNER (EXTENSION)	23.85
POLE PRUNER (SHORT)	23.75
SALTER SCALE (150 KG)	372.00
SALTER SCALE (100 KG)	145.00
COCOA POLYBAG (1000 BAGS)	15.75

SOURCE: Agricultural Supplies & Equipment Pty Ltd, P.O Box 1121, Rabaul.

11.4 HAND TOOLS

DESCRIPTION/ITEM	PRICE, KINA
HOES	3.60 - 11.58
SHOVELS	5.58 - 19.95
SPADES	4.86 - 25.34
RAKES	
Quality rakes - 14 T	3.99
Quality lawn/leaf rakes with handle	11.95
FORKS	8.75 - 25.86
WHEEL BARROWS	
Light duty with pneumatic tire	43.95
Heavy duty with pneumatic tire	72.00
Sturdy barrows - ST22A	29.95
Sturdy barrows - ST25A	31.95

DESCRIPTION/ITEM	PRICE, KINA
MATTOCKS & PICKS	4.07 - 10.88
CROW BARS	22.95
SECATEURS	5.22 - 62.00
BUSHKNIVES	3.50 - 5.46
PRUNING SAWS	7.85 - 24.01

SOURCE: Brian Bell & Co Pty Ltd, P.O Box 1228, Boroko, N.C.D.

12.0 FINANCIAL CHARGES

12.1 LOAN FACILITIES AVAILABLE TO THE AGRICULTURAL SECTOR AND FARMERS

TABLE 1: Loan facilities available to the Agricultural Sector and Farmers

Type of Loan	Current Interest Rate	Annual Effective	Amount & Term	Required Security
1. Fully Drawn Loan (FDL)	15%pa	15.865%pa	+	**
2. Overdrafts (O/D)	15%pa +	15.865%pa	+	**
3. Credit Guarantee Loans (CGL)	13%pa	13.648%pa	+	**
4. Temporary Excess (T/E)	19%*	19.397%pa	+	**
5. Lease Finance	19.5%pa	21.341%pa	+	**
6. Personal Loan	10% flat pa	+	+	**

* Penalty rates also apply when loan falls into arrears

+ Refer notes below

** Refer notes below and section 12.3

1. Fully Drawn Loan

All Agricultural loans and farmers maybe referred to this facility.

- a) Amount and Term: For large plantations, amount of loan maybe K300,000 for a minimum term of 5 years and maximum term of 10 years. Also refer section 12.2.
- b) Security: Preferably a Registered First Mortgage over farm/property. Other acceptable securities also shown on section 12.3. Security Margin is 60% of Bank valuation.
- c) Interest Rate: 15% pa, 2.25% above Lending Indicator Rate (LIR)
- d) Charges and Fees: Refer section 12.4 and 12.5.
- e) Other requirements: Cash Flow Budget and Feasibility Studies.

This facility is a form of short term finance. It is only approved on cases where a business experience cashflow difficulties (ie for genuine day to day working requirements on business accounts).

- a) Amount and Term: Amount negotiable and a limit will be established. Drawings must not exceed the limit. The loan must be cleared with three (3) months.
- b) Security: As in 1 above. Extra security maybe required.
- c) Interest Rate: 15% pa, 2.25% above LIR. This rate applies to permanent overdraft limit established. Overdrafts on cheque accounts will attract 19% pa interest rate.
- d) Charges and Fees: Refer section 12.4 and 12.5.
- e) Other requirements: Proof of Cashflow Budget difficulties.

3.

Credit Guarantee Loans

This is a scheme introduced by the PNG Government to assist Papua New Guineans to obtain loans for particular purposes where because of insufficient security or lack of business experience, the Customer would not qualify for a loan if the Banks normal Lending Standards were used.

- a) Amount and Term: For individuals, the maximum amount of loan is K50,000.-. For Joint Accounts, Partnerships and Business Groups, the maximum loan is K50,000 per member to a maximum of K200,000. Maximum loan to a company under the scheme K200,000. The repayment term is preferred to be 5 years. However in the case of Agriculture, the maximum term is 10 years but in some cases, this can be extended to 15 years with the consent of the Minister for Finance.
- b) Security: The Government Guarantees 80% of the outstanding balance of the loan at any time. Other acceptable security is also required.
- c) Interest Rate: 13%, 0.25% above LIR
- d) Charges and Fees: Establishment fee (Refer section 12.4) and a "loan insurance premium of 2% of the loan amount approved.

- e) Requirements : Only automatic PNG Citizens or Business Groups. For Companies, 74% of the share capital must be owned by, and management of the company be in the Hand of PNG Citizens.
- (Eligibility)

4. Temporary Excess

Another short term finance facility where Customers are allowed to overdraw their cheque accounts (working accounts) or increase existing loan accounts.

- a) Amount and Term: Amount is negotiable and loan term is three (3) months.
- b) Security: Required security as in 1 above and where necessary, additional security is required.
- c) Interest Rate: 19%, 6.25% above LIR
- d) Charges and Fees: Establishment fee Refer section 12.4.
- e) Other Requirements: Purpose of the excess must be within the Banks current Lending Policy.

5. Lease Finance (Equipment Leasing)

A lease finance transaction is one where the Bank purchases an item of equipment (eg: Office equipment, farm equipment such as tractor etc.) and rents it out to the applicant under a "lease agreement". At the end of the lease period, it is a normal practice for the Bank to invite an offer from the lessee to purchase the equipment not less than the residual value.

- a) Amount and Term: Minimum of K20,000 (ie cost of equipment must be K20,000 or more).
- b) Security: The Bank owns the equipment and the lessee must comply with the covenants of the lease agreement. Acceptable securities as in 1 above required.
- c) Interest Rate: 19.5%
- d) Charges and Fees: i) Stamp duty fee (Refer section 12.4)
ii) Production fee of K40- per lease agreement
iii) Registration of Document fee is K0.75

6. Personal Loan

This loan facility maybe considered for individual farmers (eg. poultry). Approval will depend upon the borrowers ability to repay the loan and acceptable securities.

- a) Amount and Term: Minimum loan amount of K200 and maximum of K10,000. Loan term range from 12 months (1 year) to 60 months (5 years). Refer table 5 (section 12.2).
- b) Security: Acceptable securities as shown on section 12.3.
- c) Interest Rate: 10% flat per annum. Annual effective interest rates per annum are 17.97% (12 months), 18.173% (18 months), 18.156 (24 months), 17.919% (36 months), 17.650% (48 months) and 17.284% for 60 months terms.
- d) Charges and Fees: Refer Table 5 in section 12.2.

12.2 LOAN REPAYMENT SCHEDULE ON FULLY DRAWN LOANS, CREDIT GUARANTEE LOANS AND PERSONAL LOANS

TABLE 2: Fully Drawn Loan Repayment Schedule at 15% Interest Rate

Term/monthly repayments (principal plus interest)			
Loan Amount	5 Years	10 Years	12 Years
2,000	48	33	30
5,000	119	81	75
10,000	238	162	150
15,000	357	243	225
20,000	476	324	300
30,000	714	486	450
40,000	952	486	600
50,000	1,190	810	750
60,000	1,428	972	900
70,000	1,666	1,134	1,050
100,000	2,380	1,620	1,500
150,000	3,570	2,430	2,250
200,000	4,760	3,240	3,000
250,000	5,950	4,050	3,750
300,000	7,140	4,860	4,500

TABLE 3: CREDIT GUARANTEE LOAN REPAYMENT SCHEDULE AT 13% INTEREST RATE

Term/monthly repayments (principal plus interest)				
Loan Amount	5 Years	10 Years	12 Years	
5,000	114	75	69	64
10,000	228	150	138	127
15,000	342	225	207	191
20,000	456	300	276	254
30,000	684	450	414	381
40,000	912	600	552	508
50,000	1,140	750	690	635
60,000	1,369	900	828	762
70,000	1,596	1,050	966	889
80,000	1,824	1,200	1,104	1,016
90,000	2,052	1,350	1,242	1,143
100,000	2,280	1,500	1,380	1,270

TABLE 4: LOAN REPAYMENT SCHEDULE AT 8% INTEREST RATE

Term/monthly repayments (principal plus interest)				
Loan Amount	5 Years	10 Years	12 Years	
2,000	41	25	22	
5,000	102	61	55	
10,000	203	122	109	
15,000	305	183	164	
20,000	406	244	218	
30,000	609	366	327	
40,000	812	488	436	
50,000	1,015	610	545	
60,000	1,218	732	654	
70,000	1,421	854	763	
100,000	2,030	1,220	1,090	
150,000	3,045	1,830	1,635	
200,000	4,060	2,440	2,180	
250,000	5,075	3,050	2,725	
300,000	6,090	3,660	3,270	

TABLE 5: PERSONAL LOAN REPAYMENT SCHEDULE**5A: 12 MONTHS TERM**

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	26 - 257	257 - 510	510 - 912
Monthly Repayment	24 - 236	236 - 468	468 - 836
Establishment Fee	6	9	120

5B: 18 MONTHS TERM

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	38 - 385	385 - 761	770 - 1,343
Monthly Repayment	16 - 164	164 - 324	324 - 572
Establishment Fee	60	9	120

5C: 24 MONTHS TERM

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	48 - 512	528 - 1,024	1,040 - 2,032
Monthly Repayment	12 - 128	128 - 252	256 - 508
Establishment Fee	60	90	120

5D: 36 MONTHS TERM

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	100 - 797	798 - 1,529	1,529 - 3,057
Monthly Repayment	12 - 92	92 - 184	184 - 368
Establishment Fee	60	90	120

5E: 48 MONTHS TERM

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	110 - 987	987 - 2,085	2,085 - 4,059
Monthly Repayment	8 - 72	72 - 152	152 - 296
Establishment Fee	60	90	120

5F: 60 MONTH TERM

Particulars (Kina)	Loan Amount (Kina)		
	2000 - 2,500	2,501 - 5,001	5,001 - 10,000
Interest	160 - 1,200	1,280 - 2,560	2,560 - 5,120
Monthly Repayment	8 - 64	64 - 128	128 - 256
Establishment Fee	60	90	120

12.3 BANKS POLICY ON SECURITY**1. Acceptable Securities (Prime Securities)**

The following securities are acceptable (or required) when a loan has been approved. These are known as "Prime Securities" which can be readily extended for extra Monetary value.

- a) Mortgages over leasehold land where the improvement conditions have been met and the lease has issued (Registered First Mortgage)
- b) Mortgages leasehold land where a building loan has been approved and the lease has issued (Registered First Mortgage)
- c) Mortgages over freehold land (whether vacant or with improvements)
- d) Second Mortgages over leasehold or freehold land (as above) which can be extended for monetary value
- e) Second Mortgages over leasehold or freehold land (as above) where a letter of priority has been obtained from the first mortgage

- f) Charges over life policies with a Surrender Value
 - g) Charges over Interest Bearing Deposits (IBD) with PNGBC or other Banks within PNG
 - h) Charges over Passbook Account Balances
 - i) Charges over inscribed Government Stock
 - j) Guarantees supported by any of the above securities
2. Other Securities (Collateral Securities)

The Bank may consider the following securities of any of the above security is not available provided the loan application is considered worthwhile:-

- a) Mortgages against leasehold land where the improvement conditions have not been met
- b) Mortgages against leasehold land where the lease has not issued
- c) Clan Land Usage Agreements
- d) Bills of Sale (R/B/S), eg. farm equipment and (tractor etc.)
- e) Combine Bills of Sale/Equitable Mortgages (R/T/B/S)
- f) Equitable Mortgages from companies (R/E/M) ie. charge over assets, stocks on farm etc.
- g) Unsupported guarantees
- h) Charges over shares
- i) Charges over life policies without a Surrender Value.

12.4 BANK CHARGES AND FEES

Various charges apply for the establishment and administration of loans from the Agriculture Bank.

Charges may vary for private individuals, companies and government departments. Charges also vary with amount borrowed or not drawn down.

Government departments are exempt from the following fees:

- Establishment Fee
- Loan Service Fee
- Stamp Duty

Full details of fees charges can be obtained from Agriculture Bank. The following are indicative rates only.

Indicative Rates	
1. Establishment Fee:	0.5 to 0.8% Minimum K200 ie. on K48,000 = K240
2. Commitment Fee:	Payable on undrawn amount of loan. KO.255 per month
3. Loan Service Fee:	Charged quarterly:
Amounts up to K200:	Minimum K3 or 1.5%
K50,000 or more	Maximum K45 or 0.045%
Amounts over 100,000	Add K15 per K100,000
4. Stand-by Limit Fee:	N/A
5. Unused Limit Fee:	
Calculated as 1% of the average amount of unused portion of loan for the period.	
ie:	$\frac{\text{Average daily unused portion}}{1} \times \frac{\text{No. of day in interest period}}{365}$
	$\times \frac{1}{100}$
6. Stamp Duty:	0.1% eg: 250,000 loan = K250
7. Documentary Fee:	K20 to K70 (More than one fee may apply depending on number of documents handled).
8. Guarantee Fee:	1 - 2 % plus stamp duty

9. Valuation Fee: K50 per hour
(Real Estate Only)
10. Other Charges and Fees: N/A

SOURCE: Papua New Guinea Banking Corporation, P.O Box 78, Port Moresby, N.C.D.

13.0 WATER SUPPLY, IRRIGATION AND DRAINAGE

13.1 WATER SUPPLY CHARGES

Commercial/Industrial

First 200,000 litres @ K1.50 per 10,000 litres per month.
Over 200,000 litres @ K6.00 per 10,000 litres per month.
Minimum charge - K30.00 per month.

Public Premises

First 250,000 litres @ K1.00 per 10,000 litres per month.
Further consumption @ K1.50 per 10,000 litres per month.
Minimum charge - K12.00 per month.

Domestic Premises

First 40,000 litres @ K1.25 per 10,000 litres per month.
Next 100,000 litres @ K5.00 per 10,000 litres per month.
Over 100,000 litres @ K10.00 per 10,000 litres per month.
Minimum charge - K5.00 per month.

Unmetered Domestic Premises

Building with water inside - K5.00 per month.
Building with stand pipe - K2.00 per month.

Other Charges - Water From Hydrant

Daily permit - K8.00 per day.
Weekly permit - K30.00 per week.
Monthly permit - K100.00 per month.

SOURCE: National Capital District Commission, P.O Box 7270, Boroko, N.C.D.

13.2 WATER TANKS

13.2.1 Southern Cross Tanks

MODEL	SIZE	GALVANISED KINA	MARVIPLATE KINA
RZB	9 KL	2,280	3,100
RZB	12 KL	2,560	3,520
RZC	15 KL	2,940	3,940
RZC	20 KL	3,210	4,410
RZD	22.5 KL	3,630	5,000
RZD	30 KL	4,050	5,600
RZE	36.5 KL	4,900	6,700
RZE	49 KL	5,400	7,700
RZF	60 KL	6,800	9,400
RZF	80 KL	7,600	10,500
RZG	90 KL	11,300	15,000
RZG	120 KL	12,900	17,000
RZH	146 KL	16,400	21,600
RZH	195 KL	17,900	23,700
RZJ	228 KL	22,800	30,000
RZJ	304 KL	24,300	32,400

SOURCE : Southern Cross, P.O Box 498, Port Moresby.

13.3 PIPES

13.3.1 Pressure Pipes

SIZES	PRICE, KINA
15 mm	3.95 each
20 mm	5.00 each
25 mm	6.20 each
32 mm	8.86 each
40 mm	11.15 each
50 mm	15.60 each
80 mm	38.70 each
100 mm	55.20 each

SOURCE : Pipemakers, P.O Box 6297, Boroko, N.C.D.

13.4 PUMPS

13.4.1 Onga Pumps

MODEL	DESCRIPTION	PRICE, KINA
344318	WPS 15 - 30 PSI 400 W	253.00
344418	WPS 20 - 40 PSI 500 W	275.00
MODEL	DESCRIPTION	PRICE, KINA
344518	WPS 25 - 45 PSI 700 W	302.00
344550	WPS 25 - 45 PSI 700 W	319.00
354350	WPS 35 - 50 PSI 1100 W	451.00
360005	WPS ADJUSTABLE 700 W	528.00
370005	" " 1200 W	638.00
380008	" " 1500 W	835.00
380003	" " 1500 W	1045.00
380033	" " 1500 W	780.00
110615	HAND PUMP	1100
AQUADEV	HAND BORE HOLE PUMP SET AT 20 METRE	1760.00
MT50	50 MM COFFEE BARE SFT	600.00
HB70	75 MM " " "	1585.00
HB76	ABOVE PUMP ON SPM FRAME AND 5.5 KW MOTOR	1950.00
DB76	75 MM DIAPHRAM PUMP.BARE SHART	2123.00

14.0 LIVESTOCK SLAUGHTER FEES

LIVESTOCK	DESCRIPTION	FEES, KINA.
Cattle	120 kg and above	38.00
	91 kg - 119 kg	32.00
	90 kg and below	25.00
Pig	all weights	14.00

Note: Generally the butcher or retailer pays the slaughter fees, NOT the seller (farmer).

SOURCE : Lae, Abattoir, 1991.

Number killed per week. Lae Central Abattoir as of 10/10/91.

Cattle K95.00 - K110.00/wk

Pig K200 - K300.00/wk

14.1 SOURCES OF STOCK SLAUGHTERED AT THE LAE CENTRAL ABBATOIR

CATTLE

Ramu Sugar Narakakapo
 Munum
 Gusap

Zifasing Cattle Ranch
Marhham farming
Sulicon/Livestock Development Corporation
Native cattle farmers

PIGS

Rumion Piggery
Agricultural Holdings/11 mile
Singawa (Pelgens)

All feedlot beef are purchased from Ramu Sugar Ranches.

15.0 STOCK FEED

ITEM/DESCRIPTION:	QUANTITY	PRICE
BROILER FINISHER - 5 KGS	1 +	4.85
BROILER FINISHER - 50 KGS	1 +	21.20
BROILER STARTER - 5 KGS	1 +	4.85
BROILER STARTER - 50 KGS	1 +	21.80
TOP DOG - 20 KGS	1 +	21.50
COBBER DOG FOOD - 15 KGS	1 +	14.50
LAYER CRUMBLE - 5 KGS	1 +	4.85
LAYER CRUMBLE - 50 KGS	1 - 5	21.00
	6 - 19	20.00
	20 +	19.00
MEAT BONE MEAL - 50 KGS	1 - 4	41.60
	5 +	37.80
MEAT BONE MEAT - 5 KGS	1 +	3.50
PIG CONCENTRATE - 5 KGS	1 +	6.75
PIG CONCENTRATE - 50 KGS	1 - 5	32.80
	6 +	31.50
PULLET DEVELOPER - 50 KGS	1 - 5	21.00
	6 - 19	20.00
	20 +	19.00
PULLET DEVELOPER - 5 KGS	1 +	4.00
PULLET GROWER - 50 KGS	1 - 5	23.00
	6 - 19	22.00
	20 +	21.00
PULLET GROWER - 5 KGS	1 +	4.85
PULLET STARTER - 5 KGS	1 +	6.50

ITEM/DESCRIPTION:	QUANTITY	PRICE
PULLET STARTER - 50 KGS	1 - 5	24.00
	6 - 19	23.00
	20 +	22.00
MINERAL SALT BLOCK-18 KGS (SUITABLE FOR HORSES)	1 - 4	12.50
	5 +	11.50
TRACE MINERAL SALT BLOCK - 18 KGS	1 - 4	12.60
	5 +	12.00
RUMEVITE - 20 KGS (HORSES)	1 +	15.45
PIG GROWER - 50 KGS	1 - 5	22.60
	6 +	21.50
PIG GROWER - 5 KGS	1 +	4.85
TROUT STARTER	1 +	42.65
TROUT GROWER	1 +	40.80
HORSE PELLETS - 50 KGS	1 - 5	19.00
	6 - 19	18.00
	20 +	17.00
LINSEED MEAL - 40 KGS *	1 +	33.00
SOYABEAN MEAL - 40 KGS	1 +	40.00
LIVERMOLE - 20 KGS *	1 +	53.00
OATEN CHAFF - 40 KGS	1 +	28.00
LUCERNE CHAFF - 35 KGS (CHEETHAM)	1 +	22.00
LUCERNE CHAFF - 40 KGS (RIVERINA)	1 +	25.00
POLLARD - 40 KGS	1 +	12.20
HORSE BRAN	1 +	12.00
WORK HORSE MIX *	1 +	19.00

ITEM/DESCRIPTION:	QUANTITY	PRICE
MILRUN - 40 KGS	1 +	12.00
COPRA MEAL - 50 KGS	1 +	15.50
WHITE-E POWDER - 3.2 KGS	1 +	119.00
WHITE-E POWDER - 800 GMS	1 +	34.40
THRIVE-G - 20 KGS	1 +	75.00
NEUTRAL SALTS - 20 KGS	1 +	96.40
COPRICE - 40 KGS	1 +	21.60

* NO DISCOUNT

SOURCE : Farnset Ltd, P.O Box 75, Goroko, E.H.P.

DESCRIPTION

KINA

ANIMAL HEALTH PRODUCTS

Alkalene 5 ltrs	27.10
Electrolyte 20 kgs	57.75
Ferrasorb 5 ltrs	31.00
Hoof Dressing 5 ltrs	19.45
Hoss Amin R 15 kgs	48.60
Hoss Amin S 15 kgs	48.60
Grenade 1 ltr	230.00
Bayofly 2 kgs	405.00
Panacur 20 ltrs	261.30
Pig Wormer Granules 1 kg	131.40
Screw Worm Smear 4 kgs	32.47
Sulfamezathine 500 mls	18.00
Valbazen 20 ltrs	208.00
Vetrazine 2 kgs	123.80
Nilverm Oral Drench 5 ltrs	105.85
White E Powder 3.2 kgs	119.00
Thrive G 20 kgs	75.00
Bio Hoof 1.5 kgs	48.40
Livamisole 80 1 ltr	27.00

SAFETY

Rubber Gum Boots	16.60
Respirators	25.55
Rubber Gloves	5.60
Safety Goggles	5.60
Filter Mask	2.40

OTHERS

Chicken Drinkers 704BB	7.20
Chicken Feeders 4051	19.41
Drench Gun 20 mls	78.00
Eartags Applicators	29.65
Coffee Picking Buckets	5.95
Sewing Thread 1 kg	10.00
Lashing Twine	15.50
Coffee Sacks	1.50
Copra Sacks	1.35

DESCRIPTION	KINA
Polyprop Sacks	0.60
Coffee Plastic Sheeting (100 m Roll)	155.00
Measuring Cup	0.95
Measuring Jub	3.40
Salter Scales 9" 100 kgs	298.00
Watering Can	18.45
Rain Coats	16.05
Onion Sacks	0.35
Ear Tags (Medium 25/Pack)	29.95
Castration Rubber Ring (100/Pack)	3.70

ASUNTOL CATTLE DIP 500 ML	25.60
AMOXYCILLIN 100 GM	35.50
FLEA/TICK SPRAY 250 GM AERO	5.30
ASUNTOL DOG WASH 100 MLS	6.40
ASUNTOL LIQUID 500 ML	18.95
BAYOFLY 2 KG PAIL	405.00
BAYOFLY 100 GMS SATCHET	22.30
BATICAL POUR-ON 1 LTR	38.00
BAYTICOL 5 LTRS	148.00
BOMACILLIN INJECTION 100 M	11.15
CITARIN L ORAL DRENCH 20 LTRS	108.00
CO-RAL PIG SPRAY 5 LTRS	126.00
DEXAVIN INJECTION 100 ML	9.80
DRONTAL ALLWORMER 2 TABS	13.50
DRONTAL ALLWORMER 5 TABS	12.50
DRONCIT	15.70
DURACIDE GUNPACK 2 LTRS	165.00
DURACIDE 2 LTRS	96.00
DRENCH GUN POUR-ON	58.00
EQUIBAN GRANULES 40 GMS	6.75
EQVALAN PASTE	13.30
FERROSAN ORAL DOSER	2.15
FLEA POWDER 200 GMS	5.10
FLUTTER VALVE SET	7.50
FORMAL DEHYDE 22 KGS	58.50
FURAL TADONE 200 GMS	13.20
GRENADE 1 LTR	230.00
HYPODERMIC NEEDLE 1 DOZ.	12.20
IVOMEK - SHEEP	178.00
IVOMEK SWINE INJECTION	61.00
IVOMEK 200 ML	112.00
IVOMEK POUR ON	40.00

DESCRIPTION	KINA
LEVAMISOLE 1 LTR	30.00
MALAWASH 1 LTR	11.82
MALAWASH 5 LTRS - ICI	53.26
NALLY TUBS	51.00
NEFTIN TABLETS - 25 TABS	8.30
NEFTIN TABLETS - 100 TABS	21.00
NEFTIN SUSPENSION 190 ML	16.50
NILVERM P/W GRANULES 1 KG	115.50
NILVERM P/W LIQUID 2.5 LTRS	66.00
PIG WORMER GRANULES 100 GMS	12.00
PIG/POULTRY WORMER 500 MLS	17.60
NILVERM PIG/POULTRY WORMER	27.70
NILVERM INJECTION 1 LTR	58.00
NILVERM POUR-ON	83.40
OXYTETRACYLINE W/S 500 GMS	45.20
PANACUR 10% 10 LTRS	504.00
PARVOCIDE 1 LTR	27.46
PARVOCIDE 5 LTRS	105.00
PENICILLIN INJECTION	32.00
PHORPASS DISINFECTANT 5 LTRS	28.40
PIPERAZINE POWDER 2.25 KGS	34.00
RIPERCOL PIG WORMER GRANULES	98.00
SCOURBAN 2 LTRS	73.00
SEPONVER 1 LTR	44.70
SEPONVER 5 LTRS	207.72
SPOTTON 4 ML	5.10
STRESSADEC 1 KG	29.50
SULFAMEZ 500 ML	15.80
SCREW WORM SMEAR 2 KGS ICI	19.50
SCREW WORM SMEAR 4 KGS ICI	33.50
SCREW WORM SMEAR 18 KGS ICI	138.00
SCREW WORM SMEAR 500 GMS ICI	7.00
SCREW WORM SMEAR MP 18 KGS	155.00
SYNOVEX S IMPLANTS 192	345.60
TAKTIC EC 2 LTRS	138.00
TEDOX 250 GMS	5.71
TELMEN HORSE PASTE 25 GMS	9.10
TERRAMYCIN PINK EYE SPRAY	11.10
TERRAMYCIN INJECTION	43.20
TERRAMYCIN P/EYE POWDER	13.10
TRIVETRIN 100 ML	30.31
TRISOPRIM 480 100 ML	31.10
VALBAZIN SHEEP DRENCH 1 LTR	25.76
VALBAZIN CATTLE DRENCH 5 LTRS	254.54

DESCRIPTION	KINA
VALBAZIN SHEEP DRENCH 20 LTRS	280.00
VITAMIN B12 50 ML	8.25
VISORBITS 50'S	7.90
VISORBITS 200'S	24.50
HORSE VITAMIN PASTE	8.66

SOURCE : Farmset Ltd, P O Box 75, Goroko, E.H.P

The indexes are fixed-weight indexes, calculated as weighted arithmetic means of price relatives multiplied by 100. The price relative for an item is the ratio of its price in a given period to its average price in the base year. The base period is calendar year 1977. This means that index levels for any period show the weighted average of price levels in that period expressed as percentages of the corresponding levels for 1977. For example, an index value of 120 in any period would show that, on average, prices have risen by 20 % since 1977; likewise an index level of 80 would show that they have fallen by 20 % since 1977. The table below shows, for each of the six indicator urban areas and for the weighted urban average, the index relating to all expenditure covered by the CPI; these indexes are referred to as "All groups" indexes.

The percentage change for an index between any two periods is calculated by subtracting the index value for the earlier period from that for the later one, dividing the result by the value for the earlier period, and multiplying by 100.

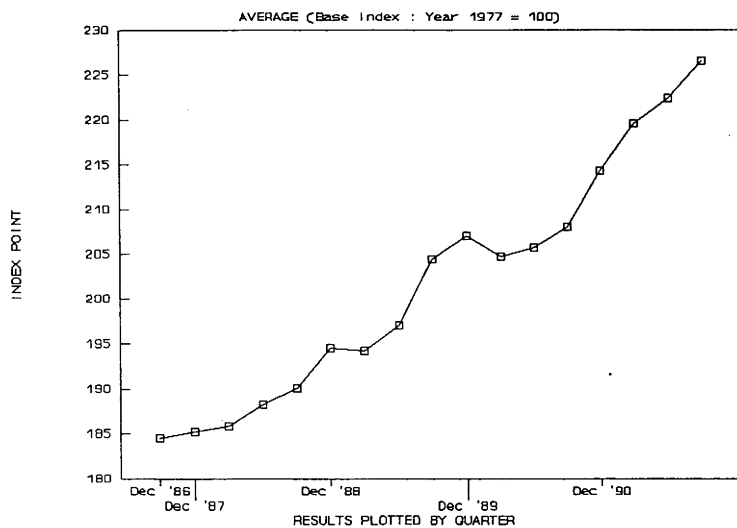
EXAMPLE :	UNROUNDED	ROUNDED
Index value for June quarter	141.658	141.7
Index value for September quarter (same year)	143.321	143.3
Difference in index values	143.321 - 141.658 = 1.663	1.7
Percentage change from June to September quarter	1.663 ----- x 100 % 141.658 = 1.174 %	1.2 %

ALL GROUPS INDEXES FOR URBAN AREAS

(Base of each index : Year 1977 = 100)

	Weighted urban average	Port Moresby	Goroko	Lae	Madang	Rabaul	Kieta Arawa Panguna
Weight	100.0	40.8	11.4	22.0	11.0	10.0	4.8
Year ended 31 December							
Dec 1986	181.3	189.0	182.0	171.6	171.8	181.7	179.5
Dec 1987	187.3	196.3	187.7	177.3	180.0	182.1	183.9
Dec 1988	197.5	208.4	192.0	186.1	193.2	191.2	193.9
Dec 1989	206.4	214.8	202.1	198.6	203.5	199.8	200.9
Dec 1990	220.7	230.8	216.7	214.3	209.6	214.6	n/a
Quarter ended							
1986 Dec	184.5	192.3	186.5	174.1	174.5	185	183.2
1987 March	185.2	194.7	186.2	174.7	175.7	180.9	181.2
June	185.8	194.6	187.1	175.9	177.9	180.4	182.5
Sept	188.2	196.8	189.8	178.2	181.4	181.7	185.3
Dec	190.1	198.9	187.8	180.2	185.0	185.7	186.5
1988 March	194.5	207.3	189.8	181.5	187.0	186.2	190.9
June	194.2	204.7	191.3	182.7	187.6	188.1	192.4
Sept	197.0	206.8	191.1	186.6	193.4	190.8	195.9
Dec	204.4	214.6	195.8	193.7	204.9	199.5	196.0
1989 March	207.0	218.5	198.3	195.5	205.7	200.0	199.4
June	204.7	212.4	200.9	196.0	206.0	198.1	199.4
Sept	205.7	212.7	204.3	198.8	203.2	197.8	202.5
Dec	208.1	215.6	204.9	204.1	198.9	203.1	202.1
1990 March	214.3	224.4	210.3	207.4	202.5	209.6	206.7
June	219.6	230	213.9	213.7	209.3	212.1	n/a
Sept	222.4	232.7	218.7	215.4	211.1	216	n/a
Dec	226.6	236	224	220.6	215.4	220.7	n/a

CONSUMER PRICE INDEX - WEIGHTED URBAN



SOURCE : National Statistical Office

1.1 COCOA AND COPRA PLANTATION MODEL BUDGET

Normal cocoa yields are assumed at 1 tonne per hectare.

Year: 1990
 Balance dates: Jan-Dec
 Plantation name: EXAMPLE
 Location: East New Britain

No.Perm.labourers: n/a

Planted areas (by age structure for cocoa):-

	<u>IMMATURE</u>	<u>MATURE</u>	<u>TOTALS</u>	
Sole cocoa				ha
Interplanted cocoa	100	250	350	ha
Sole copra				ha
Other crops				ha
Total Planted Area:			<u>350</u>	ha

PRODUCTION:

	<u>TOTAL TONNES</u>	
Sole cocoa		(dry bean)
Interplanted cocoa	250.0	(dry bean)
Copra	330.0	

BUDGET:-

<u>INCOME:</u>	<u>VOLUME (tonnes)</u>	<u>KINA</u>	
Cocoa Sales	250	300,000	DIS (Standardised to
Copra Sales	530	108,600	DIS (DIS + Bounty basis)
Other crops	n/a		
Processing	n/a		
Other farm	n/a		
Non-farm	n/a		
Cash Revenue (A)	<u>n/a</u>	<u>408,600</u>	

STOCK ADJUSTMENT: (cost of sales)

	<u>VOLUME</u>	<u>KINA</u>
COCOA:	Nil	Nil
COPRA:	Nil	Nil
Total Stock Adjustments (B)	<u>0</u>	<u>0</u>
TOTAL REVENUE (with adjustments):		<u>\$408,600</u>

VARIABLE COSTS:

	KINA	Kina per mature ha	Kina per tonne
Cocoa:			
Crop husbandry	50,750	225.56	203.00
Chemicals	18,750	83.33	75.00
Harvesting	28750	127.78	115.00
Processing	22500	100.00	90.00
Despatch	7,500	33.33	30.00
Miscellaneous	6,250	27.78	25.00
Sub-total cocoa:	134,500	597.78	538.00
Copra V.Costs:	60,000	1,714	113.21
Total V.Costs (C)	194,500		

NOTES: Crop freight does not to include freight to FOB.

Revenue is net of levies.

O/HEAD COSTS	KINA	COCOA		COPRA	
		Per ha	Per tonne	Per ha	Per tonne
Contracting	2500	7.68	6.92	22.03	1.46
Gen.casual labour	0	0.00	0.00	0.00	0.00
Permanent labour	6250	19.21	17.29	55.09	3.64
Management salar's	30,000	92.20	82.98	264.41	17.46
Consultant/Agents	23,000	70.69	63.62	202.72	13.39
Security	3,250	9.99	8.99	28.64	1.89
General freight	500	1.54	1.38	4.41	0.29
Fuel & oil	10000	30.73	27.66	88.14	5.82
Repair & maintenance	12500	38.42	34.58	110.17	7.28
Electricity/power	2800	8.61	7.74	24.68	1.63
Administration	10000	30.73	27.66	88.14	5.82
Insurances	3,750	11.53	10.37	33.05	2.18
Rent paid	3,600	11.06	9.96	31.73	2.10
Interest	36,250	61.47	55.32	176.28	11.64
HP/leases	0	49.94	44.95	143.22	9.46
Deprn. (non cash)	11,500	35.34	31.81	101.36	6.69
Total O/heads (D)	155,900	479	431	1,374	91
Total Expenses	350,400	1,077	969	3,088	204
Profit before tax	58,200	(Includes stock adjustments)			
		[(A) + (B)] less [(C) + (D)]			

LESS:

		Per	
		Total (K)	Immature ha
Taxation	0		
Personal drawings	0		
Capital purchases	22,750		
Development	53,900		
Loan principal	0		
NET SURPLUS	(18,450)		
/(DEFICIT)			

DEVELOPMENT COSTS:

V.Costs & O/heads
Interest capitalised
Share F.Asset deprn

44,000
6,800
3,100
53,900

440.00
68.00
31.00
539.00

NOTES: 1. Development expenditure is deductible for taxation purposes.

2. Overheads are allocated to cocoa and copra in proportion to the ratio of their variable costs.

3. Most plantations are limited liability companies, hence there are no personal drawings.

4. Since the AgBank did not calculate interest on development loans in 1990, contingent liabilities are K50,000 - K70,000.

5. Prinipal repayments are deferred.

6. Redevelopment area is unusually high since the Government has encouraged this; more usually around 15 % of the cocoa area would be under redevelompnt at any one time.

SECTION 3

CASH CROPS, FOOD CROPS AND LIVESTOCK BUDGETS

GROSS MARGINS: (Kina)

	<u>Total</u>	<u>Per Ha</u>		
Total Gross Margin	214,100	612		
Gross Margin Cocoa	165,500	736	Assumes copra is	10.0%
Gross Margin Copra	48,600	1,389	of interplanted area.	

SENSITIVITY TABLES:-

	<u>COCOA</u>		<u>COPRA</u>	
	Yield per hectare (tonnes)	Price per tonne (Kina)	Yield per hectare (tonnes)	Price per tonne (Kina)
-20%	0.889	\$960	12.114	\$164
-10%	1.000	\$1,080	13.629	\$184
Model	1.111	\$1,200	15.143	\$205
+10%	1.222	\$1,320	16.657	\$225
+20 %	1.333	\$1,440	18.171	\$246

COCOA:**GROSS MARGIN (per hectare)**

KINA / HECTARE		CHANGE TO COCOA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YEILD	-20%	308	414	521	628	734
	-10%	388	508	628	748	868
	Model	469	602	736	869	1,002
	+10%	549	696	843	989	1,136
	+20%	630	790	950	1,110	1,270

GROSS MARGIN (per tonne)

KINA / TONNE		CHANGE TO COCOA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YEILD	-20%	277	373	469	565	661
	-10%	350	458	566	674	782
	Model	422	542	662	782	902
	+10%	495	627	759	891	1,023
	+20%	567	711	855	999	1,143

COPRA:GROSS MARGIN (per hectare)

KINA / HECTARE		CHANGE TO COPRA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YIELD	-20%	614	863	1,111	1,359	1,607
	-10%	691	970	1,250	1,529	1,808
	Model	768	1,078	1,389	1,699	2,009
	+10%	845	1,375	1,527	1,869	2,210
	+20%	922	1,294	1,666	2,039	2,411

GROSS MARGIN (per tonne)

KINA / TONNE		CHANGE TO COPRA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YIELD	-20%	51	71	92	112	133
	-10%	51	71	92	112	133
	Model	51	71	92	112	133
	+10%	51	83	92	112	133
	+20%	51	71	92	112	133

NOTE: Copra gross margin does not change with yield since all variable costs for copra are per tonne costs (harvesting, processing & despatch)

SOURCE: Based on DAL/Cocoa Board Plantation Cost of Production and viability survey. Farm Management Unit, DAL, 1991

1.2 SOLE COCOA: MANAGED VILLAGE PLANTATION

Normal cocoa yields are assumed at 1.2 tonnes per hectare.

Year: 1990
Balance dates: Jan-Dec
Plantation name: EXAMPLE
Location: East New Britain

No.Perm.labourers: n/a

Planted areas (by age structure for cocoa):-

	<u>IMMATURE</u>	<u>MATURE</u>	<u>TOTALS</u>
Sole cocoa	0	27	27 ha
Interplanted cocoa			0 ha
Sole copra			ha
Other crops			ha

Total Planted Area: 27 ha

PRODUCTION:

	<u>TOTAL</u> <u>TONNES</u>	
Sole cocoa	32.0	(dry bean)
Interplanted cocoa	0.0	(dry bean)
Copra	0.0	

BUDGET:-

<u>INCOME:</u>	<u>VOLUME</u> <u>(tonnes)</u>	<u>KINA</u>	
Cocoa Sales	32	38,400	DIS
Copra Sales	0	0	DIS
Other crops	n/a		
Processing	n/a		
Other farm	n/a		
Non-farm	n/a		
Cash Revenue (A)	<u>n/a</u>	<u>38,400</u>	

STOCK ADJUSTMENT: (cost of sales)

	<u>VOLUME</u>	<u>KINA</u>
COCOA:	Nil	Nil
COPRA:	Nil	Nil
Total Stock Adjustments (B)	<u>0</u>	<u>0</u>
TOTAL REVENUE (with adjustments):		<u>\$38,400</u>

VARIABLE COSTS:

	<u>KINA</u>	<u>Kina per mature ha</u>	<u>Kina per tonne</u>
Cocoa:			
Crop husbandry	5,800	214.81	181.25
Chemicals	2,000	74.07	62.50
Harvesting	4,500	166.67	140.63
Processing	3,980	147.41	124.38
Despatch	2,100	77.78	65.63
Miscellaneous	500	18.52	15.63
Sub-total cocoa:	<u>18,880</u>	<u>699.26</u>	<u>590.00</u>
Copra V.Costs:	<u>0</u>	<u>0</u>	<u>0.00</u>
Total V.Costs (C)	<u>18,880</u>		

NOTES: Crop freight does not to include freight to FOB.
Revenue is net of levies.

<u>O/HEAD COSTS</u>	<u>KINA</u>	<u>COCOA</u>		<u>COPRA</u>	
		<u>Per ha</u>	<u>Per tonne</u>	<u>Per ha</u>	<u>Per tonne</u>
Contracting	0	0.00	0.00	0.00	0.00
Gen.casual labour	0	0.00	0.00	0.00	0.00
Permanent labour	0	0.00	0.00	0.00	0.00
Management salar's	1,400	51.85	43.75	0.00	0.00
Consultant/Agents	7,000	259.26	218.75	0.00	0.00
Security	0	0.00	0.00	0.00	0.00
General freight	0	0.00	0.00	0.00	0.00
Fuel & oil	100	3.70	3.13	0.00	0.00
Repair & maintenance	70	2.59	2.19	0.00	0.00
Electricity/power	0	0.00	0.00	0.00	0.00
Administration	1730	64.07	54.06	0.00	0.00
Insurances	0	0.00	0.00	0.00	0.00
Rent paid	350	12.96	10.94	0.00	0.00
Interest (charges)	500	18.52	15.63	0.00	0.00
HP/leases	0	0.00	0.00	0.00	0.00
Deprn. (non cash)	0	0.00	0.00	0.00	0.00
Total O/heads (D)	<u>11,150</u>	<u>413</u>	<u>348</u>	<u>0</u>	<u>0</u>
Total Expenses	<u>30,030</u>	<u>1,112</u>	<u>938</u>	<u>0</u>	<u>0</u>
Profit before tax	<u>8,370</u>	(Includes stock adjustments) [(A) + (B)] less [(C) + (D)]			
LESS:					Per
Taxation	0	<u>DEVELOPMENT COSTS:</u>		<u>Total (K)</u>	<u>Immature ha</u>
Personal drawings	0	V.Costs & O/heads		0	0.00
Capital purchases	0	Interest capitalised		0	0.00
Development	0	Share F.Asset deprn		0	0.00
Loan principal	0			0	0.00
NET SURPLUS	<u>8,370</u>			<u>0</u>	<u>0.00</u>
/(DEFICIT)					

- NOTES: 1. Most plantations are limited liability companies, hence there are no personal drawings.
2. Since the AgBank did not calculate interest on development loans in 1990, contingent liabilities are K25,000
3. Principal repayments are deferred.

GROSS MARGINS: (Kina)

	<u>Total</u>	<u>Per Ha</u>		
Total Gross Margin	19,520	723		
Gross Margin Cocoa	19,520	723	Assumes copra is	0.0%
Gross Margin Copra	0	0	of interplanted area.	

SENSITIVITY TABLES:-

	<u>COCOA</u>		<u>COPRA</u>	
	Yield per hectare (tonnes)	Price per tonne (Kina)	Yield per hectare (tonnes)	Price per tonne (Kina)
-20%	0.948	\$960	0.000	\$0
-10%	1.067	\$1,080	0.000	\$0
Model	1.185	\$1,200	0.000	\$0
+10%	1.304	\$1,320	0.000	\$0
+20%	1.422	\$1,440	0.000	\$0

COCOA:**GROSS MARGIN (per hectare)**

KINA / HECTARE		CHANGE TO COCOA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YEILD	-20%	289	403	517	631	744
	-10%	364	492	620	748	876
	Model	439	581	723	865	1,007
	+10%	513	670	826	982	1,139
	+20%	588	758	929	1,100	1,270

GROSS MARGIN (per tonne)

KINA / TONNE		CHANGE TO COCOA PRICE				
		-20%	-10%	Model	+10%	+20%
CHANGE TO YEILD	-20%	244	340	436	532	628
	-10%	307	415	523	631	739
	Model	370	490	610	730	850
	+10%	433	565	697	829	961
	+20%	496	640	784	928	1,072

1.3 COCOA PLANTATION COSTS OF PRODUCTION:

1989, 1990 Actuals

COCOA PER TONNE COSTS OF PRODUCTION: 1989 and 1990 (Actuals)

	1989		1990	
	MEAN N=25	SAMPLE S.D.	MEAN N=25	SAMPLE S.D.
Yield per mature ha (tonnes):	0.919	0.493	0.627	0.247
Price per tonne (DIS): (Kina)	1,366	138	1,191	111
VARIABLE COSTS/TONNE:				
Crop husbandry	255.22	171.26	243.85	109.06
Fertiliser	44.71	92.94	24.90	38.59
Chemicals	90.78	95.13	118.39	93.45
Harvesting	172.08	127.22	156.30	42.23
Processing	134.84	178.47	122.87	60.97
Despatch	45.40	44.12	47.87	34.59
Other	75.90	158.19	48.57	102.02
Sub-total:	818.93	505.57	762.74	222.98
OVERHEAD COSTS/TONNE:				
Contract/cas.lab.	8.93	20.31	17.63	31.76
Permanent labour	57.93	119.90	32.88	74.95
Management sal's	132.06	114.28	152.53	96.15
Consultant/Agents	143.40	203.70	156.94	143.54
Security	11.93	20.98	15.98	17.79
General freight	7.35	20.07	3.23	8.97
Fuel/Oil	31.73	43.79	50.61	51.76
Repairs & maintenance	84.88	89.81	69.34	61.37
Electricity/power	6.15	11.34	12.16	16.03
Administration	53.34	38.42	53.89	32.71
Insurances	17.07	15.54	21.65	14.78
Rent/sundr's/other	29.02	42.82	19.31	33.32
Interest on w.capital	96.82	68.74	102.77	39.15
Depreciation	58.61	54.39	64.86	50.81
Sub-total:	739.22	545.43	773.76	306.94
TOTAL COST PER TONNE: (KINA)	1,558.15	981.42	1,536.50	395.55

NOTE: The above costs do not include any allowance for cocoa redevelopment. No yield adjustments have been made to reflect mature average yields for cocoa; consequently the above figures reflect actual cost of production for the sample in 1989 and 1990, not the costs of production for efficient producers inclusive of replacement of senile cocoa.

COCOA COSTS OF PRODUCTION INCLUSIVE OF COCOA REDEVELOPMENT AND AT THREE MATURE YIELD LEVELS:-

YIELD:(tonnes/hectare)	1.00	1.30	1.60
Direct costs including O/heads and interest on working capital:	1,227	1,080	985
Cocoa redevlopment:	158	122	99
Total Costs of Production (1991)	\$1,385	\$1,202	\$1,084

**SOURCE: DAL/Cocoa Board: Cocoa Cost of Production and Plantation
Viability Survey 1991. Final Report**

1.4 1991 COFFEE PLANTATION COSTS OF PRODUCTION

Area (ha)	100.0			
Yield (tonnes/ha)	1.95			
			C.O.P. ANALYSIS	
Revenue:	Per Tonne	Totals	Per Tonne	Per ha.
- DIS (excl.bounty)	1,500	292,500	1,500	2,925
- Bounty	350	68,250	350	683
TOTAL REVENUE:	<u>\$1,850</u>	<u>\$360,750</u>	<u>\$1,850</u>	<u>\$3,608</u>
Per tonne costs:	Per Tonne	Totals		
Harvesting	325	63,375	325	634
Processing - To parchment	125	24,375	125	244
- To green bean	141	27,495	141	275
Despatch	20	3,900	20	39
TOTAL PER TONNE COSTS	<u>\$611</u>	<u>\$119,145</u>	<u>\$611</u>	<u>\$1,191</u>
Per hectare costs:	Per ha.	Totals		
Fertiliser	445	44,500	228	445
Herbicides	100	10,000	51	100
Fungicide	75	7,500	38	75
Insecticide	25	2,500	13	25
Tree maintenance	273	27,300	140	273
TOTAL PER HECTARE COSTS	<u>\$918</u>	<u>\$91,800</u>	<u>\$471</u>	<u>\$918</u>
TOTAL VARIABLE COSTS		<u>\$210,945</u>	<u>\$1,082</u>	<u>\$2,109</u>
GROSS MARGIN		<u>\$149,805</u>	<u>\$768</u>	<u>\$1,498</u>
Fixed costs:		Totals		
Management		40,000	205	400
Consultants		0	0	0
Field supervisors		11,600	59	116
Fuel/oil		14,300	73	143
Repairs & maint.		13,100	67	131
Accounting		3,500	18	35
Insurances		3,500	18	35
Administration		2,800	14	28
Legal		1,000	5	10
Rent		4,000	21	40
Electricity		1,200	6	12
Miscellaneous		4,200	22	42
Interest (working capital)	[CALC.]	13,343	68	133
Depreciation (non cash)		25,400	130	254
TOTAL FIXED COSTS		<u>\$137,943</u>	<u>\$707</u>	<u>\$1,379</u>
TOTAL COSTS OF PRODUCTION		<u>\$348,888</u>	<u>\$1,789</u>	<u>\$3,489</u>
NET MARGIN BEFORE DEBT INTEREST		<u>11,863</u>	<u>\$61</u>	<u>\$119</u>

SENSITIVITY ANALYSIS:

- COST OF PRODUCTION

		YIELD: Tonnes/ha.				
		1.56	1.76	1.95	2.15	2.34
KINA/TONN		2084	1920	1789	1682	1593

- GROSS MARGIN

	KINA PER HECTARE	Tonnes/ha.				
		1.56	1.76	1.95	2.15	2.34
Price K/tonne	1,480	438	607	777	946	1,115
	1,665	726	932	1,137	1,343	1,548
	1,850	1,015	1,256	1,498	1,740	1,981
	2,035	1,303	1,581	1,859	2,136	2,414
	2,220	1,592	1,906	2,220	2,533	2,847

- NET MARGIN BEFORE DEBT INTEREST

	KINA PER HECTARE	Tonnes/ha.				
		1.56	1.76	1.95	2.15	2.34
Price K/tonne	1,480	319	488	658	827	997
	1,665	608	813	1,019	1,224	1,430
	1,850	896	1,138	1,379	1,621	1,863
	2,035	1,185	1,462	1,740	2,018	2,296
	2,220	1,473	1,787	2,101	2,415	2,728

SOURCE : COFFEE INDUSTRY BOARD, GOROKA.

1.5 SMALLHOLDERS COFFEE BUDGETS: Based on
Farm Management Survey of Smallholder Coffee Growers,
Western and Southern Highlands Provinces.

Means of samples:	n = 30	n = 31
	Hagen	
<u>PHYSICAL DATA:-</u>	<u>Central</u>	<u>Kagua</u>
Area in coffee (ha)	0.77	0.37
Food crop area (ha)	0.78	0.62
Yield per ha (Kg)	961	560
Price per Kg (Kina)	0.91	0.69
Gross sales (Kg coffee)	667	204
Net sales (Kg coffee)	515	172
No. of pigs	4.4	5.1
No. of chickens	16.8	4.3

<u>INCOME:-</u>	<u>KINA</u>	<u>KINA</u>
Coffee sales (net)	577.00	140.00
Livestock sales (net)	564.00	338.00
Food crop sales	394.00	144.00
Other income	887.00	106.00
TOTAL CASH INCOME:	2,422.00	728.00

CASH EXPENSES:- (Kina)

Coffee -	Wages	157.63	14.00
	Chemicals	86.03	10.48
	Fertiliser	0.00	0.00
	Trees/seeds	1.00	4.03
	Fuel/Oil	0.07	0.00
	Bags	3.93	0.97
	Freight in	2.20	0.26
	Freight out	8.63	13.32
	R. & Maint.	10.00	0.00
	Other	12.13	0.45
Sub-total expenses coffee		<u>281.62</u>	<u>43.51</u>
Food crop expenses		116.12	2.68
L/stock, other expenses		<u>185.55</u>	<u>19.05</u>
TOTAL CASH EXPENSES:		<u>583.29</u>	<u>65.24</u>
NET CASH SURPLUS (Kina)		<u>1,838.71</u>	<u>662.76</u>
(before capital purchases)			

Cost of Production for Coffee:

Kina per tonne (excludes unpaid family labour)	\$338.00	\$177.00
Gross margin for coffee:	\$295.38 Total	\$96.49 Total
	\$383.61 per ha	\$260.78 per ha

CAPITAL FORMATION:-KINAKINA

Asset purchases: (for cash)	120.00	10.00
Capital formation:(value of)		
- Additional Land cleared	92.00	108.00
- Construction	149.00	250.00
Level of savings:	465.00	23.00

LIABILITIES:-

Formal loans	50.00	0.00
Informal loans	72.00	22.00

ASSETS:-

Buildings	135.00	31.00
Vehicles & plant	1,460.00	4.00
Creditors	431.00	261.00

SOURCE: FARM MANAGEMENT UNIT, Policy Planning and Budgeting Division, DAL.

1.6 SMALLHOLDER PEANUT PRODUCTION

Size is < 0.5ha

Yield (tonne/ha)	1.5
Price (K/tonne)	500.00
TOTAL INCOME:	\$750.00

VARIABLE COSTS	Costed Operations	Qty	unit	K/unit	Per Hectare
CONTRACTING FEES:					
Ploughing	1	4	hr/ha	20.00	80.00
Harrowing	2	1	hr/ha	20.00	40.00
Planting	0	2	hr/ha	20.00	0.00
Spraying	0	0.5	hr/ha	20.00	0.00
Digging	0	1	hr/ha	20.00	0.00
Threshing	0	1	hr/ha	20.00	0.00
Drying #	0	1	tonne	20.00	0.00
Total contracting fees					\$120.00

CHEMICALS:					
Stomp	0	3.5	L/ha	7.86	0.00
Blazer	0	3	L/ha	5.34	0.00
Calixin	2	0.3	L/ha	25.00	15.00
Bavistin	2	0.3	L/ha	30.00	18.00
Total chemicals					\$33.00

OTHER INPUTS:					
Seed	1	80	Kg/ha	1.00	80.00
Bags #	1	35	bags	0.60	31.50
Total other inputs					\$111.50

TOTAL VARIABLE COSTS:	\$264.50
GROSS MARGIN PER HECTARE:	\$485.50

LABOUR REQUIREMENTS:- Person days

	Costed Operations	Qty	Total pers days	K/day	Per Hectare
Land preparation	0	0	0	0.00	0.00
Planting seed	1	30	30	0.00	0.00
Chemical spraying	4	4	16	0.00	0.00
Fertiliser appl.	0	0	0	0.00	0.00
Weeding	4	12	48	0.00	0.00
Harvest, bag & & transfer to sale #	1	32	48	0.00	0.00

GROSS MARGIN PER PERSON DAY	142 /ha	\$0.00
	\$3.42	

NOTE: # denotes per tonne cost which varies with yield
A tractor is employed for initial ground cultivation.
Family labour is used for all other operations.

GROSS MARGIN SENSITIVITY ANALYSIS:

	<u>Per ha</u>	<u>Per tonne</u>
Total per tonne costs:	\$31.50	\$21.00
Total per hectare costs:	\$233.00	\$155.33

Gross Margin (Kina/hectare)		YIELD PER HECTARE				
		1.00	1.25	1.50	1.75	2.00
	400.00	146.00	240.75	335.50	430.25	525.00
PRICE	450.00	196.00	303.25	410.50	517.75	625.00
PER						
TONNE	500.00	246.00	365.75	485.50	605.25	725.00
(K)						
	550.00	296.00	428.25	560.50	692.75	825.00
	600.00	346.00	490.75	635.50	780.25	925.00

RETURN PER PERSON DAY

Total Person Days:-		126	134	142	150	158
Gross Margin Kina Per Person Day		YIELD PER HECTARE				
		1.00	1.25	1.50	1.75	2.00
	400.00	1.16	1.80	2.36	2.87	3.32
PRICE	450.00	1.56	2.26	2.89	3.45	3.96
PER						
TONNE	500.00	1.95	2.73	3.42	4.04	4.59
(K)						
	550.00	2.35	3.20	3.95	4.62	5.22
	600.00	2.75	3.66	4.48	5.20	5.85

SOURCE: D.A.L., ERAP

1.7 MEDIUM SCALE PEANUT PRODUCTION

Size is (1-10 ha)

Shared tractor is used for most field operations.

Yield (tonne/ha)

1.5

Price (K/tonne)

500.00

TOTAL INCOME: **\$750.00**

<u>VARIABLE COSTS</u>	<u>Costed</u> <u>Operations</u>	<u>Qty</u>	<u>unit</u>	<u>K/unit</u>	<u>Per</u> <u>Hectare</u>
CONTRACTING FEES:					
Ploughing	1	4	hr/ha	20.00	80.00
Harrowing	3	1	hr/ha	20.00	60.00
Planting	1	2	hr/ha	20.00	40.00
Spraying	4	0.5	hr/ha	20.00	40.00
Digging	1	1	hr/ha	20.00	20.00
Threshing	1	1.5	hr/ha	20.00	30.00
Drying #	1	1	tonne	20.00	30.00

Total contracting fees **\$300.00**

CHEMICALS:

Stomp	1	3.5	L/ha	7.86	27.51
Blazer	1	3	L/ha	5.34	16.02
Calixin	2	0.3	L/ha	25.00	15.00
Bavistin	2	0.3	L/ha	30.00	18.00

Total chemicals **\$76.53**

OTHER INPUTS:

Seed	1	80	Kg/ha	1.00	80.00
Weeding	1	12	md/ha	4.30	51.60
Bags #	1	35	bags	0.60	31.50

Total other inputs **\$163.10**

TOTAL VARIABLE COSTS: **\$539.63**

GROSS MARGIN PER HECTARE: **\$210.37**

NOTE: # denotes per tonne cost which varies with yield

	<u>Per ha</u>	<u>Per tonne</u>
Total per tonne costs:	\$61.50	\$41.00
Total per hectare costs:	\$478.13	\$318.75

GROSS MARGIN SENSITIVITY ANALYSIS:

GROSS MARGIN (Kina/hectare)		YIELD PER HECTARE				
		1.00	1.25	1.50	1.75	2.00
PRICE PER TONNE (K)	400.00	(119.13)	(29.38)	60.37	150.12	239.87
	450.00	(69.13)	33.12	135.37	237.62	339.87
	500.00	(19.13)	95.62	210.37	325.12	439.87
	550.00	30.87	158.12	285.37	412.62	539.87
	600.00	80.87	220.62	360.37	500.12	639.87

SOURCE: D.A.L., ERAP

1.8 LARGE SCALE PEANUT PRODUCTION

Size is (11-100 ha)

Costs of running own tractor are included.

Yield (tonne/ha)

1.5

Price (K/tonne)

500.00

TOTAL INCOME:

\$750.00

VARIABLE COSTS

	Costed Operations	Qty	unit	K/unit	Per Hectare
CONTRACTING FEES:					
Ploughing	1	4	hr/ha	14.00	56.00
Harrowing	3	1	hr/ha	14.00	42.00
Planting	1	2	hr/ha	14.00	28.00
Spraying	4	0.5	hr/ha	14.00	28.00
Digging	1	1	hr/ha	14.00	14.00
Threshing	1	1.5	hr/ha	14.00	21.00
Drying #	1	1	tonne	14.00	21.00

Total contracting fees

\$210.00

CHEMICALS:

Stomp	1	3.5	L/ha	7.86	27.51
Blazer	1	3	L/ha	5.34	16.02
Calixin	2	0.3	L/ha	25.00	15.00
Bavistin	2	0.3	L/ha	30.00	18.00

Total chemicals

\$76.53

OTHER INPUTS:

Seed	1	80	Kg/ha	1.00	80.00
Weeding	1	12	md/ha	4.30	51.60
Bags #	1	35	bags	0.60	31.50

Total other inputs

\$163.10

TOTAL VARIABLE COSTS:

\$449.63

GROSS MARGIN PER HECTARE:

\$300.37

NOTE: # denotes per tonne cost which varies with yield

	<u>Per ha</u>	<u>Per tonne</u>
Total per tonne costs:	\$52.50	\$35.00
Total per hectare costs:	\$397.13	\$264.75

GROSS MARGIN SENSITIVITY ANALYSIS:

GROSS MARGIN (Kina/hectare)		YIELD PER HECTARE				
		1.00	1.25	1.50	1.75	2.00
PRICE PER TONNE (K)	400.00	(32.13)	59.12	150.37	241.62	332.87
	450.00	17.87	121.62	225.37	329.12	432.87
	500.00	67.87	184.12	300.37	416.62	532.87
	550.00	117.87	246.62	375.37	504.12	632.87
	600.00	167.87	309.12	450.37	591.62	732.87

SOURCE: D.A.L., ERAP

1.9 SMALLHOLDER MAIZE PRODUCTION

Shared tractor (up to 50ha cultivated), Ford 4610 4wd tractor.

Yield (tonne/ha)	4.0
Price (K/tonne)	\$200.00

TOTAL INCOME:	\$800.00
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<u>Cost of tractor operations:</u>	<u>Costed Operations</u>	<u>Qty</u>	<u>unit</u>	<u>K/unit</u>	<u>TOTAL KINA/HA</u>
Ploughing	1	4	hr/ha	20.00	80.00
Harrowing	3	1	hr/ha	20.00	60.00
Planting	1	2	hr/ha	20.00	40.00
Interow cultivation	1	1	hr/ha	20.00	20.00
Spraying	4	0.5	hr/ha	20.00	40.00
Threshing #	1	1	t/hr	20.00	20.00

Total cost of tractor operations	260.00
----------------------------------	--------

FERTILISERS:

Sulphate of Ammonia	1	350	kg/ha	0.28	98.00
Urea	1	50	kg/ha	0.35	17.50

Total Fertiliser Cost	115.50
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CHEMICALS:

Stomp	1	3	L/ha	7.86	23.58
Atrazine	1	4	kg/ha	4.80	19.20
Malathion	1	0.3	L/ha	25.00	7.50

Total chemical cost	50.28
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OTHER INPUT COSTS:

Seed	1	18	Kg/ha	3.40	61.20
Harvesting	1	3	md/ha	4.30	12.90
Bags #	1	20	bags	0.60	48.00
Drying #	1		K/t	10.00	40.00

Total miscellaneous input costs	162.10
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TOTAL VARIABLE INPUT COSTS:	587.88
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GROSS MARGIN:	212.12
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NOTE: # denotes per tonne cost which varies with yield

Total per tonne costs:	\$108.00	\$27.00 /tonne
Total per hectare costs:	\$479.88	

GROSS MARGIN SENSITIVITY ANALYSIS:

GROSS MARGIN (Kina/hectare)		YIELD PER HECTARE				
		3.00	3.50	4.00	4.50	5.00
PRICE PER TONN (K)	180.00	(20.88)	55.62	132.12	208.62	285.12
	190.00	9.12	90.62	172.12	253.62	335.12
	200.00	39.12	125.62	212.12	298.62	385.12
	210.00	69.12	160.62	252.12	343.62	435.12
	220.00	99.12	195.62	292.12	388.62	485.12

SOURCE: D.A.L., ERAP, LAE.

1.10 SMALLHOLDER MAIZE PRODUCTION

Tractor Owners (up to 50ha); Ford 4610 4wd.

Yield (tonne/ha)	4.0
Price (K/tonne)	\$200.00

TOTAL INCOME:	\$800.00
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<u>Cost of tractor operations:</u>	<u>Costed Operations</u>	<u>Qty</u>	<u>unit</u>	<u>K/unit</u>	<u>TOTAL KINA/HA</u>
Ploughing	1	4	hr/ha	14.00	56.00
Harrowing	3	1	hr/ha	14.00	42.00
Planting	1	2	hr/ha	14.00	28.00
Interrow cultivation	1	1	hr/ha	14.00	14.00
Spraying	4	0.5	hr/ha	14.00	28.00
Threshing #	1	1	t/hr	14.00	14.00

Total cost of tractor operations	182.00
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FERTILISERS:

Sulphate of Ammonia	1	350	kg/ha	0.28	98.00
Urea	1	50	kg/ha	0.35	17.50

Total Fertiliser Cost	115.50
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CHEMICALS:

Stomp	1	3	L/ha	7.86	23.58
Atrazine	1	4	kg/ha	4.80	19.20
Malathion	1	0.3	L/ha	25.00	7.50

Total chemical cost	50.28
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OTHER INPUT COSTS:

Seed	1	18	Kg/ha	3.40	61.20
Harvesting	1	3	md/ha	4.30	12.90
Bags #	1	20	bags	0.60	48.00
Drying #	1		K/t	10.00	40.00

Total miscellaneous input costs	162.10
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TOTAL VARIABLE INPUT COSTS:	509.88
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GROSS MARGIN:	290.12
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NOTE: # denotes per tonne cost which varies with yield

Total per tonne costs:	\$102.00	\$25.50 /tonne
Total per hectare costs:	\$407.88	

GROSS MARGIN SENSITIVITY ANALYSIS:

GROSS MARGIN (Kina/hectare)		YIELD PER HECTARE				
		3.00	3.50	4.00	4.50	5.00
PRICE PER TONN (K)	180.00	55.62	132.87	210.12	287.37	364.62
	190.00	85.62	167.87	250.12	332.37	414.62
	200.00	115.62	202.87	290.12	377.37	464.62
	210.00	145.62	237.87	330.12	422.37	514.62
	220.00	175.62	272.87	370.12	467.37	564.62

SOURCE : D.A.L, ERAP, LAE.

1.11 COST OF PRODUCTION: MAIZE

Based on LDC data.

		PER TONNE COSTS		
EXPENDITURE ITEM:	Per Ha	Yield tonnes/hectare:-		
		3.00	3.50	4.00
Crop Protection	59.80	19.93	17.09	14.95
Fertiliser	68.35	22.78	19.53	17.09
Fuel & Oil	51.80	17.27	14.80	12.95
Land Rent	20.00	6.67	5.71	5.00
Leasing Costs	4.04	1.35	1.15	1.01
Maintenance	43.16	14.39	12.33	10.79
Seed	74.00	24.67	21.14	18.50
Vehicle Expenses	10.00	3.33	2.86	2.50
Wages	50.83	16.94	14.52	12.71
Grp Tax/Bank Charges	19.17	6.39	5.48	4.79
Accountancy Audit	10.00	3.33	2.86	2.50
Insurance	23.33	7.78	6.67	5.83
Rent (house)	13.00	4.33	3.71	3.25
Salaries	72.63	24.21	20.75	18.16
Gratuity	0.00	0.00	0.00	0.00
Education	15.00	5.00	4.29	3.75
Staff Amenities	1.25	0.42	0.36	0.31
Postage/Stationary	0.54	0.18	0.15	0.14
Superannuation	4.42	1.47	1.26	1.10
Telephone	7.50	2.50	2.14	1.88
Travel	11.25	3.75	3.21	2.81
Interest on W.Expenses	58.81	19.60	16.80	14.70
Depreciation	48.34	16.11	13.81	12.09
	\$667.22	\$222.41	\$190.63	\$166.80
PRICE PER TONNE:		\$200.00	\$200.00	\$200.00
MARGIN:		(\$22.41)	\$9.37	\$33.20

1.12 SMALLHOLDER BANANAS - CROP COST ANALYSIS (DRYLAND)

1.1 GENERAL DATA

1 HECTARE MODEL

Plant Crop Population :	1000 plants/ha	Losses - Farm	10%
Ratoon Crop Population :	2000 plants/ha	- Marketing	5%
Plant crop duration :	9 months	Quality - Premium	40%
Ratoon cycle :	7 months	- Seconds	60%
Number of Ratoons :	9 ratoons	Sale Price - Premium	0.65 K/kg
Crop Yield Recovery :	90%	- Seconds	0.50 K/kg

The high percentage of second quality fruit is due more to market demand than to actual fruit quality.

YIELD ADJUSTED FOR FIELD AND MARKETING LOSSES

Bunch Weight (Kg)	Plant Crop (tonnes/ha)	Ratoon Crop (tonnes/ha)
15	12.8	25.5
20	17.0	34.0
25	21.3	42.5
30	25.5	51.0
35	29.8	59.5
40	34.0	68.0
45	38.3	76.5
50	42.5	85.0

1.2 GROSS INCOME (Kina)

1 HECTARE MODEL

Bunch Weight (kg)	Plant Crop (Kina)	Ratoon Crop (Kina)
15	7,140	14,280
20	9,520	19,040
25	11,900	23,800
30	14,280	28,560
35	16,660	33,320
40	19,040	38,080
45	21,420	42,840
50	23,800	47,600

NOTE: Plant crop duration is 9 months. Ratoon crop duration 7 months.
With 9 ratoon crops replanting is required in year 7.

1.3 FIELD PRODUCTION COSTS

OPERATIONS	COST / UNIT (K)	UNIT RATE	Plant crop K/ha/crop	Ratoon K/ha/crop
Land clearing	30.00 / hr	8 hrs/ha	240.00	0.00
Land preparation	25.00 / hr	6 hrs/ha	150.00	0.00
- Corm preparation	4.50 / md	50 md/ha	225.00	0.00
Planting	4.50 / md	37.5 md/ha	168.75	0.00
Establishment Weeding	4.50 / md	10 md/ha	45.00	0.00
Weed spray	4.50 / md	2 md/ha/month	81.00	63.00
- Agral 60	3.00 / L	0.2 L/ha/month	5.40	4.20
- Gramoxone	7.00 / L	1 L/ha/month	63.00	49.00
Fertilizing	4.50 / md	2 md/ha/2 mths	40.50	31.50
- Urea	0.30 / kg	0.45 kg/stool/yr	101.25	157.50
- Potassium chloride	0.30 / kg	0.6 kg/stool/yr	135.00	210.00
- NPK	0.35 / kg	0.9 kg/stool/yr	306.25	367.50
Manure Spreading	4.50 / md	5 md/ha/6 mths	33.75	26.25
Nematode/Borer control	4.50 / md	2 md/ha/6 mths	13.50	10.50
- Furadan	4.80 / kg	0.06 kg/stool/yr	216.00	336.00
Fungicide spraying	4.50 / md	0.5 md/ha/month	20.25	15.75
- Fuel	0.65 / L	2 L/ha/month	11.70	9.10
- Calixin	22.00 / L	1 L/ha/month	198.00	154.00
- Bavistin	35.00 / L	0.3 L/ha/2 mths	47.25	36.75
- Tilt	55.00 / L	0.4 L/ha/2 mths	99.00	77.00
- De-tron	1.70 / L	13 L/ha/month	198.90	154.70
Trashing	4.50 / md	2 md/ha/month	81.00	63.00
Desuckering	4.50 / md	2 md/ha/month	81.00	63.00
- kerosene	0.50 / L	20 L/ha/month	90.00	70.00
Thrip control	4.50 / md	0.25 md/ha/month	3.38	3.38
- Perfekthion	15.00 / L	0.1 L/ha/month	4.50	4.50
Debelling/Trimming	4.50 / md	4 md/2000 plts	9.00	18.00
Bunch covering	4.50 / md	15 md/2000 plts	33.75	67.50
- Bunch covers	0.50 / cover	1 cover/bunch	125.00	250.00
Tying/Propping	4.50 / md	30 md/ha	135.00	135.00
- Twine	65.00 / roll	1 roll/ha	65.00	65.00
- Props	0.50 / Prop	250 props/ha	125.00	125.00
Harvesting (2 men)	4.50 / md	50 bunches/day	162.00	324.00
Materials Transport	50.00 / load	1 load/ha/2mths	225.00	175.00
TOTAL PER HA VARIABLE COSTS:			\$3,539	\$3,066

1.4 POST HARVEST COSTS

	COST /UNIT	UNIT RATE	K/tonne	t/kg
Cutting and crating	4.50 /md	4 md/tonne	18.00	1.8
Power (cooling)	7.50 /day	4 Days/tonne	30.00	3.0
Ethrel	30.00 /L	0.3 L/tonne	9.00	0.9
Plastic Liners	0.02 /Liner	50 Liners/tonne	1.00	0.1
Dipping and Packing	4.50 /md	2 md/tonne	9.00	0.9
Cartons	1.35 /carton	50 carton/tonne	67.50	6.8
Fuel (transport)	20.00 /tonne	1 tonne	20.00	2.0
TOTAL PER TONNE VARIABLE COSTS:			\$154.50	15.5

1.5 SUMMARY OF LABOUR REQUIREMENTS (included above)

OPERATIONS	COST /UNIT (K)	UNIT RATE	Plant crop K/ha/crop	Ratoon K/ha/crop
FIELD PRODUCTION:				
Corn preparation	4.5 /md	50 md/ha	225	0
Planting	4.5 /md	37.5 md/ha	168.75	0
Establishment Weeding	4.5 /md	10 md/ha	45	0
Weed spray	4.5 /md	2 md/ha/month	81	63
Fertilizing	4.5 /md	2 md/ha/2 mths	40.5	31.5
Manure Spreading	4.5 /md	5 md/ha/6 mths	33.75	26.25
Nematode/Borer control	4.5 /md	2 md/ha/6 mths	13.5	10.5
Fungicide spraying	4.5 /md	0.5 md/ha/month	20.25	15.75
Trashing	4.5 /md	2 md/ha/month	81	63
Desuckering	4.5 /md	2 md/ha/month	81	63
Thrip control	4.5 /md	0.25 md/ha/month	3.375	3.375
Debelling/Trimming	4.5 /md	4 md/2000 plts	9	18
Bunch covering	4.5 /md	15 md/2000 plts	33.75	67.5
Tying/Propping	4.5 /md	30 md/ha	135	135
Harvesting (2 men)	4.5 /md	50 bunches/day	162	324
Sub-total labour:	252 man days	Plant crop	\$1,133	\$821
	182 man days	Ratoon crop		

POST HARVEST OPERATIONS	COST /UNIT	UNIT RATE	K/tonne	t/kg
Cutting and crating	4.5 /md	4 md/tonne	18	1.8
Dipping and Packing	4.5 /md	2 md/tonne	9	0.9
Sub-total labour:		6 md/tonne	\$27.00	2.7

1.6 GROSS MARGINS

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GROSS MARGIN (net of labour costs)

1 HECTARE MODEL

Bunch Weight (Kg)	Plant Crop (Kina)	Ratoon Crop (Kina)
15	1,631	7,274
20	3,354	10,721
25	5,078	14,168
30	6,801	17,614
35	8,525	21,061
40	10,248	24,508
45	11,971	27,955
50	13,695	31,401

SENSITIVITY ANALYSIS FOR GROSS MARGIN (net of labour costs) FOR RATOON CROP WITH CHANGES TO YIELD (bunch weight) AND PRICE.

GROSS MARGIN (Kina):

Net Crop Yield (tonnes)	-10%	PRICE 1 Ha Model	+10%
25.5	5,846	7,274	8,702
34.0	8,817	10,721	12,625
42.5	11,788	14,168	16,548
51.0	14,758	17,614	20,470
59.5	17,729	21,061	24,393
68.0	20,700	24,508	28,316
76.5	23,671	27,955	32,239
85.0	26,641	31,401	36,161

Model Sale Price:-

- Premiums	0.65 K/kg
- Seconds	0.5 K/kg

GROSS MARGIN (before deducting labour costs)

1 HECTARE MODEL

Bunch Weight (Kg)	Plant Crop (Kina)	Ratoon Crop (Kina)
15	3,108	8,784
20	4,946	12,460
25	6,784	16,136
30	8,623	19,812
35	10,461	23,489
40	12,299	27,165
45	14,137	30,841
50	15,975	34,517

GROSS MARGIN PER MAN DAY

Bunch Weight (Kg)	Plant Crop Kina/md	Ratoon Crop Kina/md
15	9.47	26.19
20	13.98	32.24
25	17.89	36.89
30	21.30	40.56
35	24.31	43.54
40	26.99	46.01
45	29.38	48.08
50	31.52	49.85

1.7 OVERHEAD COSTS

	Plant Crop (9 months)	Ratoon Crop (7 months)
Interest on working capital	180	171
Depreciation	1,736	1,350
Repairs and maintenance	1,577	1,226
TOTAL OVERHEADS	\$3,492	\$2,747

NOTE: Interest on working capital is calculated as half pre-harvest field costs (excluding labour) @ 16.5 % rate of interest.

1.8 RETURN ON CAPITAL (percent)

[net of labour charges]

	Plant Crop (9 months)	Ratoon Crop (7 months)
BUNCH WEIGHT (KG)	30	30
TONNES/HA EQUIVALENT (net of losses)	25.5	51.0
Gross Income (Kina)	14,280	28,560
LESS: Variable Costs	7,479	10,946
Gross Margin	6,801	17,614
LESS: Overheads (excluding interest)	3,312	2,576
Profit before taxation	3,489	15,038
Total Capital Costs	17,420	17,420
RETURN ON CAPITAL (%) (ONE CROP)	20.0%	86.3%

RETURN ON CAPITAL WITH CHANGE IN YIELD:

Bunch Weight (Kg)	Plant Crop (9 months)	Ratoon Crop (7 months)
15	-9.6%	27.0%
20	0.2%	46.8%
25	10.1%	66.5%
30	20.0%	86.3%
35	29.9%	106.1%
40	39.8%	125.9%
45	49.7%	145.7%
50	59.6%	165.5%

1.9 NET RETURN PER MANDAY

	Plant Crop (9 months)	Ratoon Crop (7 months)	
EXAMPLE: Bunch Weight	30	30	KG
Saleable weight	25.5	51.0	tonnes/ha
Gross margin (Kina)	8,623	19,812	+ before labour costs
LESS: Int.on W.Capital	180	171	deducted.
Depreciation	1,736	1,350	
Repairs & maintenance	1,577	1,226	
Profit before taxation	5,131	17,065	(interest deducted)
NET RETURN PER MANDAY	\$12.68	\$34.94	

NET RETURN PER MAN DAY WITH CHANGE IN YIELD:

Bunch Weight (Kg)	Plant Crop (9 months)	Ratoon Crop (7 months)
15	(1.17)	18.00
20	4.11	25.14
25	8.68	30.61
30	12.68	34.94
35	16.20	38.45
40	19.32	41.36
45	22.12	43.80
50	24.63	45.88

1.10 CAPITAL COSTS AND ASSOCIATED OVERHEADS

1 HECTARE MODEL

ITEMS:	Deprn Rate	R & M Rate	KINA
- misblower	20.0%	10.0%	500
- knapsack sprayer	20.0%	10.0%	120
- tools	20.0%	5.0%	300
- crates	20.0%	20.0%	1,800
- coolroom	10.0%	7.5%	5,000
- post-harvest equipment	10.0%	7.5%	700
- vehicle (second hand)	20.0%	20.0%	5,000
- field buildings	5.0%	5.0%	2,500
- post-harvest buildings	5.0%	7.5%	1,500
- land			N/A

SUB-TOTAL CAPITAL \$17,420

Depreciation \$2,314
Repairs & maintenance \$2,102

1.11 CASH FLOW FOR MODEL 1 HECTARE BLOCK DRYLAND BANANAS

[Labour costs are included]

REVENUE:-	YEARS:	t/ha	kg/bunch	3	4	5	6	Terminal Values
YIELDS: Plant Crop Ratoon Crop	0	25.5	30					
		51.0	30					
Plant crop Ratoon crop	0	14,280	57,120	28,560	57,120	57,120	57,120	57,120
TOTAL REVENUE	0	14,280	57,120	28,560	57,120	57,120	57,120	11,250
WORKING EXPENDITURE:-								
Plant crop - per ha - per tonne	0	3,539						
		3,940						
Ratoon crop - per ha - per tonne	0	767	5,256	5,256	5,256	5,256	5,256	5,256
		0	15,759	7,880	15,759	15,759	15,759	15,759
Repairs and maintenance	0	2,102	2,102	2,102	2,102	2,102	2,102	2,102
CAPITAL COSTS:-	17,420							
TOTAL COSTS	17,420	10,347	23,117	15,238	23,117	30,837	23,117	0
NET CASH FLOW	(17,420)	3,933	34,003	13,322	34,003	26,283	34,003	11,250
Internal Rate Return	92.2%							
Net Present Value @ 10%	88,776	KINA						

SOURCE: DAL, ERAP, LAE.

L13 NUCLEUS ESTATE AND SMALLHOLDER OILPALM PROJECT - ORO PROVINCE

SMALLHOLDER OILPALM DEVELOPMENT LABOUR BUDGET AND CASH FLOW:-

DEVELOPMENT & MAINTENANCE LABOUR REQUIREMENTS														
PROJECT YEAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CALENDAR YEAR	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
BLOCK	1	2	3	4	5	6	7	8	9	10	11	12	13	14
AREA (HA)	1	2	3	4	5	6	7	8	9	10	11	12	13	14

DEVELOPMENT LABOUR REQUIREMENTS:

LAND CLEARING	30	0	0	0	0	0	0	0	0	0	0	0	0	0
LINING & HOLING	3	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANTING	2	0	0	0	0	0	0	0	0	0	0	0	0	0
HARVEST PATHS	12	0	0	0	0	0	0	0	0	0	0	0	0	0
COVER CROP EST.	2	0	0	0	0	0	0	0	0	0	0	0	0	0
MANDAYSHA	49	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL MANDAYS	98	0	0	0	0	0	0	0	0	0	0	0	0	0

MAINTENANCE LABOUR REQUIREMENTS:

WEED CONTROL	12	24	24	12	5	5	5	5	5	5	5	5	5	5
FERTILIZER	2	2	2	2	0	0	0	0	0	0	0	0	0	0
PEST & DISEASE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FROND PRUNING	0	0	5	5	5	5	5	5	5	5	5	5	5	5
MANDAYSHA	14	26	31	19	10	10	10	10	10	10	10	10	10	10
TOTAL MANDAYS	28	52	62	38	20	20	20	20	20	20	20	20	20	20
BLOCK	2	2	2	2	2	2	2	2	2	2	2	2	2	2
AREA (HA)	2	2	2	2	2	2	2	2	2	2	2	2	2	2

DEVELOPMENT LABOUR REQUIREMENTS:

LAND CLEARING	0	30	0	0	0	0	0	0	0	0	0	0	0	0
LINING & HOLING	0	3	0	0	0	0	0	0	0	0	0	0	0	0
PLANTING	0	2	0	0	0	0	0	0	0	0	0	0	0	0
HARVEST PATHS	0	12	0	0	0	0	0	0	0	0	0	0	0	0
COVER CROP EST.	0	2	0	0	0	0	0	0	0	0	0	0	0	0
MANDAYSHA	0	12	24	24	12	5	5	5	5	5	5	5	5	5
TOTAL MANDAYS	0	24	48	48	24	10	10	10	10	10	10	10	10	10

MAINTENANCE LABOUR REQUIREMENTS:

WEED CONTROL	0	12	24	24	12	5	5	5	5	5	5	5	5	5
FERTILIZER	0	2	2	2	2	2	2	2	2	2	2	2	2	2
PEST & DISEASE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FROND PRUNING	0	0	5	5	5	5	5	5	5	5	5	5	5	5
MANDAYSHA	0	14	26	31	19	12	12	12	12	12	12	12	12	12
TOTAL MANDAYS	0	28	52	62	38	24	24	24	24	24	24	24	24	24

HARVESTING MANDAY REQUIREMENTS:

- HARVEST/HEAP @ ROADSIDE	0	0	0	12	36	60	72	72	72	72	72	72	72	72
1 MANDAY/TONNE	0	0	0	12	36	60	72	72	72	72	72	72	72	72
TOTAL MANDAYS	0	0	0	12	36	60	72	72	72	72	72	72	72	72

[illegible]

NOTES:

- a. Basic semi-permanent house with water tank work K1800 to be built in the 3rd year
- b. Yr. 3 Harvesting Tools (2x W/Barrows @ K45 each, 1x5° Chisel @ K7, 1x Oilsone @ K3.50, and Yr. 4-15 Repairs and Replacements @ K20/Yr.
- c. Chainsaw hire at the fixed rate of K7/hr for 1 day on 8 hrs per day operations
- d. Weed Control spraying programme controlled by DAL in Kunal problem areas
- e. Cover Crop seed rate of 2.5g/ha @ K5/kg in Both Year 1 & 2
- f. Drains put in by the owner as sweat labour
- g. 120 Palms/Ha @ K2/Palm, including transportation cost at the rate of K0.20/seedling
- h. Ammonium Chloride to be applied at the rate of 62.5g/ha/round, 4 rounds/yr, for the first 3 Yrs in each of the two blocks.
- i. Cost of Ammonium Chloride - K11/50kg bag
- j. Pest & Disease Control to be carried out by DAL
- k. Annulmentation Fee

Fresh Fruit Bunch: FARM GATE PRICES:

CALENDAR YEAR:

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
- CONSTANT (K/T)	20	19	21	22	24	26	28	27	25	24	23	22	21	21	21
- CURRENT (K/T)	20	24	28	30	33	37	40	39	39	38	37	35	37	39	41
STABILIZATION:															
BOUNTY(+)/LEVY(-)															
- CONSTANT (K/T)	11	11	8	2	(3)	(2)	(2)	(2)	0	0	1	2	2	1	0
- CURRENT (K/T)	11	12	9	2	(3)	(2)	(3)	(3)	0	0	2	4	3	3	0
INFLATION FACTORS:															
- MUV INDEX	1.000	1.115	1.113	1.161	1.247	1.310	1.378	1.439	1.501	1.567	1.637	1.711	1.794	1.881	1.972
- CPI	1.000	1.070	1.134	1.191	1.250	1.313	1.379	1.448	1.520	1.596	1.676	1.760	1.847	1.940	2.037

1.14 SURVEY RESULTS FROM FARM MANAGEMENT SURVEY OF SMALLHOLDER COCOA PRODUCERS, KARKAR ISLAND, MADANG PROVINCE

SOURCE: Farm Management Unit, DAL.

1.1 SUMMARY OF PHYSICAL, INCOME AND EXPENDITURE DATA FOR A SAMPLE OF 20 COCOA PRODUCERS

SAMPLE SIZE	n-20	MINIMUM	MAXIMUM	MEAN	S.D
Cocoa area (ha) total		0.76	5.0	2.19	135
Labour Units.		2.0	8.2	4.27	187
Livestock: Numbers					
Pigs	Adult	2	8	4.0	225
	Young	0	14	4.8	4.2
Chickens			1	54	
9.45	13.1				
Goats		1	1	0.05	N/A
Income: (net of purchases)					
Cocoa - Kina		0	1296	178	283
Copra - Kina		0	2600	528	666
Livestock		0	1150	160	260
Food Crops		0	520	88	111
Others		50	928	309	264
Exchange (Kina-equivalent)		(711)	504	(7)	241
TOTAL CASH INCOME:		173	4058	1121	905
TOTAL INCOME INCLUDING EXCHANGE:		(227)	3347	1113	806
Expenses: (Cash)					
Cash Crop:					
	Wages	0	300	26	67
	Chemicals	0	210	18	49
	Fertilizer	0	30	2	0
	Trees/seeds	0	816	72	190
	Fuel	0	120	11	34
	Bags	0	48	12	14
	Wire/twine	0	12	2	4
	Freight-in	0	21	2	5
	Freight-out	0	276	73	83
	R/M	0	100	5	0
Food Crops		0	340	38	87
Others		0	300	37	82
TOTAL EXPENSES		0	1808	297	384
Cash Holding Surplus		36	3546	878	790
CHS +/- Exchange		(148)	4284	878	960

Cocoa areas range from 0.76 to 5.0 hectares with a mean of 2.19 ha. Cocoa blocks had been established for a mean of 9.35 years with the range being 2 years to 30 years. 7 blocks had been established 4 years or less and yielded little or no cocoa. 3 blocks were reported to be around 30 years old and 2 of these yielded income of less than K100/annum with the trees at or approaching senescence.

Harvested yields of cocoa ranged from NIL to 1.2 tonnes per hectare from recently established sole cocoa blocks under the SCCREP Programme. Mean yield per hectare was 380 kg per hectare over all blocks inclusive of those which were newly established and non-yielding.

With non-yielding cocoa blocks 3 years or less of age excluded, the mean yield increases to 480 kg per hectare.

Since copra areas were not measured, copra yields per hectare cannot be calculated from the survey data.

1.3**COCOA INCOME**

Cocoa income ranged from NIL to K1,296 per annum, with a mean of K178.

Cocoa income per kg wet bean averaged 23 toea; with a range of 20 toea to 30 toea. This represents a price per tonne of dry bean ranging from K500 to K750 per tonne with a mean of K575 per tonne dry bean or about 50% of final market price (DIS) inclusive of bounty.

Growers do not pay freight on cocoa since the Karkar Company collects cocoa weekly from growers.

1.4**COPRA INCOME**

Copra income ranged from nil to K2,600 per annum with a mean of K528. Copra is a more significant source of income than cocoa for smallholders currently.

Copra income per kilogram ranged from 11 toea per kilogram to 22 toea per kilogram; some of this variation results from the fact that there are two methods of selling copra. If copra is shipped on the boat owned by Kulili Estates, the growers pay for the freight at time of shipment. If the copra is shipped using other companies, the cost of freight is paid to the shipping company by the Copra Marketing Board and the amount deducted from sales receipts.

The mean price was 19 toea per kilogram.

Freight on a bag of copra (average weight 65 kilograms) is K2.00/bag from holding to Karkar wharf and K2.30 from wharf to Madang. This represents K4.30/bag or K66 per tonne which is about 34% of the price received by producers.

Reducing freight costs for smallholders would significantly increase incomes.

No freight costs were incurred by smallholders surveyed for cocoa since the Karkar Company collects cocoa from growers.

FOOD CROP INCOME

4 Smallholders (20% of sample) reported that they did not sell food crops. For the sample as a whole, income from food crops average only K88/annum; one respondent reported an annual income of K520 from the sale of food crops. There is no urban population on Karkar and food crops are sold to other villagers or to labour from the plantations.

Other income sources ranged from selling betelnut and tobacco to income from relatives or small tradestore or PMV business. The range of income from other sources was K50 to K928 per annum with a mean of K310.

Respondents were asked to rank the food crops sold in order of importance as a source of cash income. The following was the ranking over all respondents.

RANK

Chinese taro	1 most important
Banana	2
Green vegetables	3.5
Kaukau	3.5
Taro tru	5
Yam	6
Sugar Cane	7.5
Corn	7.5
Cassava	9

1.7 SOURCES OF INCOME

DISTRIBUTION OF CASH INCOME AS A PERCENTAGE OF TOTAL INCOME

Cocoa	14%
Copra	42%
Livestock	12%
Food Crops	7%
Others	25%
	100%

1.8 EXPENDITURE

EXPENDITURE ITEMS AS A PERCENTAGE OF TOTAL WORKING EXPENSES

	<u>% of total</u>	<u>% of Cash</u> <u>Crop Expenses</u>
Cash Crop Expenses:		
Wages	8.8	11.7
Chemicals	6.1	8.1
Fertilizer	0.7	0.9
Trees/Seeds	24.2	32.3
Fuel	3.7	4.9
Bags	4.0	5.4
Wire/twine	0.7	0.9
Freight - In	0.7	0.9
Freight - Out	24.6	32.7
Repairs/maintenance	1.7	2.2 (100)
Food Crop Expenses	12.8	N/A
Other Expenses	12.5	N/A
	100%	

1.9 COCOA COSTS OF PRODUCTION

Sample Size: n = 15	<u>MIN</u>	<u>MAX</u>	<u>MEAN</u>	<u>S.D.</u>
Total Cocoa Costs	0	491	95	142
Cocoa Costs/ha	0	260	63	94
Cocoa Costs/tonne	0	536	101	158

CASH COSTS OF PRODUCING COCOA BASED ON A SAMPLE OF 15 YIELDING COCOA BLOCKS

Note: Costs exclude owners and family labour (non-cash). In the sample of 20 cocoa growers, 4 growers had immature non-yielding cocoa and one grower had such low yield from a 3 year old block that this record was excluded when calculating cost of production.

Within the sample of 15 growers for whom costs of production were calculated, six reported incurring no cash expenditure on cocoa.

1.10 LIVESTOCK INCOME

(Kina)	<u>MIN</u>	<u>MAX</u>	<u>MEAN</u>	<u>S.D.</u>
Sales	0	1150	160	260
Exchange	(400)	408	7.40	135
Purchases	0	0	0	0
Net L/stock Income	(200)	1150	168	273

LIVESTOCK INCOME FOR 20 KARKAR SMALLHOLDERS

1.11 LABOUR

	<u>Age Group</u>	<u>Mean Labour Units</u>	
Cash Crops Labour:	8-16	0.23	
	> 16	1.40	1.63
Food Crop Labour:	8-16	0.44	
	> 16	2.10	2.54
Other Labour:	8-16	0.11	
	> 16	-	0.11
Total Labour Units:		4.27	

LABOUR UNITS AND LABOUR ALLOCATION FOR 20 KARKAR SMALLHOLDERS

Most labour is employed on food crops (50% of total). Both men and women work on food crops; their is likely to be a division of labour between men and women in the food gardens but this information was not recorded.

1.12 GARDEN AREAS

Areas represent that area actually being harvested to provide food at the time of the survey; as opposed to gardens being cleared and planted for the next seasons food crop.

<u>Respondent</u>	<u>Garden Areas</u> <u>(Ha)</u>	<u>Number of</u> <u>Adult</u>	<u>Area per Adult</u> <u>Unit: household member</u>
(L) 1	0.125 ha	4.0	312 M2
(L) 2	0.60	6.2	968
(H) 3	0.76	14.0	540
(H) 4	0.41	7.0	585
(L) 5	0.24	4.2	571
(L) 6	0.31	5.8	535

Mean = 585

SD = 212

(L) = low altitude and coastal villages, (H) = High altitude village.

FOOD CROP GARDEN AREAS FOR A SAMPLE OF 20 KARKAR SMALLHOLDERS

1.13 CAPITAL FORMATION (KINA)

	<u>MIN</u>	<u>MAX</u>	<u>MEAN</u>	<u>S.D.</u>
Construction	0	2700	325	612
Additional Land Cleared	0	1530	139	391
Asset Purchases	0	2264	338	747
Change in Savings	N/A	N/A	N/A	N/A

CAPITAL FORMATION FOR THE SAMPLE OF 20 KARKAR SMALLHOLDERS (KINA)

Values for construction and additional land cleared are calculated from reported person days multiplied by K4.50/day (the rural wages rate); However, the rural wage rate is about twice the actual rate paid in the informal rural economy.

Additional land cleared was classified as being the cultivation of land over and above that usually cultivated.

Clearing a new garden of similar size to replace an existing garden in a shifting cultivation system was not regarded as an addition to cultivated area.

35% of respondents reported asset purchases for farming use; items ranged from crop spraying equipment to the purchase of a vehicle (used for both produce transport and private use).

SAVINGS:

Current levels of savings (balances on deposit) were reported to range from nil to K5,000 with a mean of K608. Five respondents reported a decrease in their level of savings (indicating a reduction in the amount on deposit), one respondent reported an increase in savings.

1.14

LIABILITIES AND ASSETS

LOANS:

Only one respondent had a loan from a recognised banking institution for an amount of K5,500 with annual repayments of K750. One respondent reported having an informal loan of K2,000.

OTHER BUILDINGS:

7 respondents (35%) had other non-traditional buildings (other than their house). Estimated values ranged from K0. to K5,500 with a mean of K450 (for the sample).

In most cases this represented investment in a copra drier; with one respondent building a cocoa fermentary.

OTHER ASSETS:

Total other assets were estimated to be valued at a mean of K1,000 (range 0 to 12,000).

The respondent whose other assets were reported to be valued at K12,000, owned two vehicles.

CREDITORS:

Seven respondents reported being owed money by others. The range of amounts owned was 0 to K300 with a mean of K44 for the sample. For the seven smallholders who were owed money the mean amount owned was K126.

1.15 MODEL RUBBER BUDGET & CASH FLOW - CUT LUMP SALES ONLY, NO FACTORY.

IMMATURE RUBBER IS LIKELY TO BE INTERCROPPED WITH FOOD CROPS. ANY REVENUE FROM SUCH CROPPING IS EXCLUDED FROM THE MODEL.

Rubber Activity 3ha: Cup Lump only - Financial Terms

FOCUSSED SMALLHOLDERS - RUBBER ACTIVITY, CASH FLOW - FINANCIAL TERMS NO FACTORY, CLUMP ONLY, CONSTANT KINA

NB: Analysis is over 30 years.

Calendar Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Project Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Field Year: Age of Initial Plantings	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Tapping Year								1	2	3	4	5	6	7	8
Yield (kg/ha) - Polyclonal								300	500	750	1000	1200	1200	1200	1200
Yield (kg/ha) - Buddings									400	550	875	1050	1225	1300	1350
Planting Year and Material															
Ha															
Yr2-1994-Polyclonal	0.75							0.23	0.38	0.56	0.75	0.90	0.90	0.90	0.90
Yr3-1995-Buddings	1.00									0.40	0.55	0.88	1.05	1.23	1.30
Yr5-1996-Buddings	1.25									0.50	0.50	0.69	1.09	1.31	1.53
Total Area	3.00														
TOTAL PRODUCTION - Tonnes Rubber								0.23	0.38	0.96	1.80	2.46	3.04	3.44	3.73
FARM GATE PRICE (FILATEX)-100% DRC-K/T								882	876	870	864	858	852	852	852
FARM GATE PRICE (CUP LUMP)-100% DRC-K/T								706	701	696	692	687	682	682	682
REVENUE - Kina															
Late Revenue: 0% of Production								0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cup Lump Revenue: 100% of Production								158.8	262.9	670.2	1244.7	1691.0	2075.5	2343.9	2544.2
TOTAL REVENUE								158.8	262.9	670.2	1244.7	1691.0	2075.5	2343.9	2544.2
COSTS OF PRODUCTION															
*Land Clearing Materials, K/ha	172	129.0	172.0	215.0											
*Terracing, K/ha	50	37.5	50.0	62.5											
		166.5	222.0	277.5	0	0	0	0	0	0	0	0	0	0	0
Ha															
*Field Development & Oper'ns:															
-Polyclonal Seedlings, K/ha		483	140.3	78.4	115.8	23.5	16.4	224.3	126.2	89.4	89.4	112.2	112.2	112.2	112.2
-Polyclonal Seedlings	0.75	362.3	105.2	58.8	86.9	17.6	12.3	168.2	94.7	67.1	67.1	84.2	84.2	84.2	84.2
-Budded Seedlings, K/ha	1.00		429.9	146.8	86.2	98.3	113.7	28.5	28.5	246.8	108.2	84.9	113.7	113.7	113.7
-Budded Seedlings, K/ha	1.25			537.3	183.5	107.7	122.8	142.1	35.6	35.6	308.3	135.3	106.1	106.1	142.1
Total Area	3.00														
Total Materials Cost		0	362.25	535.1	742.9	336.5	248.8	338.8	158.7	349.4	483.7	304.3	275.1	303.9	339.9
*Field Transport, K/tonne	80	0	0	0	0	0	0	18.0	30.0	77.0	144.0	197.0	243.5	275.0	298.5
TOTAL COSTS		166.5	584.3	812.6	742.9	223.6	248.8	356.8	188.7	426.4	627.7	501.3	518.6	578.9	638.4
CASH FLOW		-166.5	-584.3	-812.6	-742.9	-223.6	-248.8	-197.9	74.2	243.8	617.0	1189.7	1556.8	1765.0	1905.8
* FRR:		0.16													

SOURCE: BRUCE CARRAD, AGRICULTURAL DEVELOPMENT SERVICES, (SINGAPORE) PTE LTD

Note: Adapted from draft report, December 1991

Calendar Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Project year	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Field Year: Age of Initial Plantings	14	15	16	18	19	20	21	22	23	24	25	26	27	28
Tapping Year	9	10	11	13	14	15	16	17	18	19	20	21	22	23
Yield (kg/ha) - Polyclonal	1200	1200	1200	1200	1200	1200	1200	1150	1100	1000	950	900	800	750
Yield (kg/ha) - Buddings	1350	1350	1350	1350	1300	1300	1250	1200	1100	1000	950	900	850	800
Planting Year and Material														
Yr2-1994 Polyclonal	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.86	0.83	0.75	0.71	0.68	0.60	0.56
Yr3-1995 Buddings	1.35	1.35	1.35	1.35	1.35	1.30	1.30	1.25	1.20	1.10	1.00	0.95	0.90	0.85
Yr5-1996 Buddings	1.63	1.69	1.69	1.69	1.63	1.69	1.63	1.63	1.56	1.50	1.38	1.25	1.19	1.13
Total Area														
TOTAL PRODUCTION - Tonnes Rubber	388	394	394	394	388	389	383	374	359	335	309	288	269	254
FARM GATE PRICE (FELATEX)-100% DRC-K/T	852	852	852	852	852	852	852	852	852	852	852	852	852	852
FARM GATE PRICE (CUP LUMP)-100% DRC-K/T	682	682	682	682	682	682	682	682	682	682	682	682	682	682
REVENUE - K/ha														
Latex Revenue: 0% of Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cup Lump Revenue: 100% of Production	2642.3	2684.9	2684.9	2684.9	2642.3	2650.8	2608.2	2548.5	2446.2	2284.3	2105.3	1960.4	1832.5	1730.3
TOTAL REVENUE	2642.3	2684.9	2684.9	2684.9	2642.3	2650.8	2608.2	2548.5	2446.2	2284.3	2105.3	1960.4	1832.5	1730.3
COSTS OF PRODUCTION														
*Land Clearing Materials, K/ha														
*Terracing, K/ha														
*Field Development & Oper'ns:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Polyclonal Seedlings, K/ha	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2
- Polyclonal Seedlings	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2
- Budded Seedlings, K/ha	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7
- Budded Seedlings, K/ha	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1
Total Area														
Total Materials Cost	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9
*Field Transport, K/tonne	310.0	315.0	315.0	315.0	310.0	311.0	306.0	299.0	287.0	268.0	247.0	230.0	215.0	203.0
TOTAL COSTS	649.9	654.9	654.9	654.9	649.9	650.9	645.9	638.9	626.9	607.9	586.9	569.9	554.9	542.9
CASH FLOW	1992.3	2030.0	2030.0	2030.0	1992.3	1999.9	1962.2	1909.6	1819.3	1676.3	1518.4	1390.5	1277.6	1187.3
* FRR:														

1.16 MODEL RUBBER BUDGET & CASH FLOW - LATEX & CUT LUMP SALES, WITH FACTORY.

IMMATURE RUBBER IS LIKELY TO BE INTERCROPPED WITH FOOD CROPS. ANY REVENUE FROM SUCH CROPPING IS EXCLUDED FROM THE MODEL.
 Rubber Activity 3ha, with Factory: CV and Cup Lump - Financial Terms
 FOCUSED SMALLHOLDERS - RUBBER ACTIVITY, CASH FLOW - FINANCIAL TERMS. NO LABOUR PAYMENTS
 CONSTANT KINA

NB: Analysis is over 30 yrs

Calendar Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Project year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Field Year: Age of Initial Plantings	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Tapping Year								1	2	3	4	5	6	7	8
Yield (kg/ha) - Polyclonal								300	500	750	1000	1200	1200	1200	1200
Yield (kg/ha) - Buddings									400	550	875	1050	1225	1300	1350
Planting Year and Material															
Ha								0.23	0.38	0.56	0.75	0.90	0.90	0.90	0.90
Yr2-1994-Polyclonal	0.75									0.40	0.55	0.88	1.05	1.23	1.30
Yr3-1995-Buddings	1.00										0.50	0.69	1.09	1.31	1.53
Yr5-1996-Buddings	1.25														
Total Area	3.00														
TOTAL PRODUCTION - Tonnes Rubber	0	0	0	0	0	0	0	0.23	0.38	0.56	0.75	0.90	0.90	0.90	0.90
FARM GATE PRICE (F/LATEX), 100% DRC-K/T		687	852	858	864	870	876	882	876	870	864	858	852	852	852
FARM GATE PRICE (CUP LUMP), 100% DRC-K/T		549	682	687	692	696	701	706	701	696	692	687	682	682	682
REVENUE - Kina															
Latex Revenue: 60% of Production															
Cup Lump Revenue: 40% of Production															
TOTAL REVENUE															
COSTS OF PRODUCTION															
*Land Clearing Materials, K/ha	172	129.0	172.0	215.0					197.2	502.7	933.6	1268.2	1556.6	1758.0	1908.2
*Terracing, K/ha	50	37.5	50.0	62.5					105.2	268.1	497.9	676.4	830.2	937.6	1017.7
	166.5	222.0	277.5						302.4	770.8	1431.5	1944.6	2386.8	2695.5	2925.9
*Field Development & Oper'nus:															
-Polyclonal Seedlings, K/ha	Ha	483	140.3	78.4	115.8	23.5	16.4	224.3	126.2	89.4	89.4	112.2	112.2	112.2	112.2
-Polyclonal Seedlings, K/ha	0.75	362.3	105.2	58.8	86.9	17.6	12.3	168.2	94.7	67.1	67.1	84.2	84.2	84.2	84.2
-Budded Seedlings, K/ha	1.00		429.9	146.8	86.2	98.3	113.7	28.5	28.5	246.8	108.2	84.9	84.9	113.7	113.7
-Budded Seedlings, K/ha	1.25			537.3	183.5	107.7	122.8	142.1	35.6	35.6	308.5	135.3	106.1	106.1	142.1
Total Area	3.00														
Total Materials Cost		166.5	362.25	535.1	742.9	356.5	248.8	338.8	158.7	349.4	483.7	304.3	275.1	303.9	339.9
*Field Transport, K/tonne	20	0	0	0.0	0.0	0.0	0.0	4.5	7.5	19.3	36.0	49.3	60.9	68.8	74.6
TOTAL COSTS		166.5	584.3	812.6	742.9	356.5	248.8	343.3	166.2	368.6	519.7	353.6	336.0	372.7	414.6
CASH FLOW		-166.5	-584.3	-812.6	-742.9	-356.5	-248.8	-160.6	136.2	402.1	911.7	1591.1	2050.8	2322.9	2511.3
* FRR:		0.19		NPV@12%	2774.7										

SOURCE: BRUCE CARRAD, AGRICULTURAL DEVELOPMENT SERVICES, (SINGAPORE) PTELTD

Note: Adapted from draft report, December 1991

Calendar Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Project year	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Field Year: Age of Initial Plantings	14	15	16	18	19	20	21	22	23	24	25	26	27	28
Tapping Year	9	10	11	13	14	15	16	17	18	19	20	21	22	23
Yield (Kg/ha) - Polyclonal	1200	1200	1200	1200	1200	1200	1200	1150	1100	1000	950	900	800	750
Yield (Kg/ha) - Buddings	1350	1350	1350	1350	1300	1300	1250	1200	1100	1000	950	900	850	800
Planting Year and Material														
Yr2-1994-Pyclonal	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.86	0.83	0.75	0.71	0.68	0.60	0.56
Yr3-1995-Buddings	1.35	1.35	1.35	1.35	1.35	1.30	1.30	1.25	1.20	1.10	1.00	0.95	0.90	0.85
Yr5-1996-Buddings	1.63	1.69	1.69	1.69	1.63	1.69	1.63	1.63	1.56	1.50	1.38	1.25	1.19	1.13
Total Area														
TOTAL PRODUCTION - Tonnes Rubber	388	394	394	394	388	389	383	374	359	335	309	288	269	254
FARM GATE PRICE (F/LATEX)-100% DRC-K/T	852	852	852	852	852	852	852	852	852	852	852	852	852	852
FARM GATE PRICE (CUP LUMP)-100% DRC-K/T	682	682	682	682	682	682	682	682	682	682	682	682	682	682
REVENUE - K/ha														
Later Revenue: 60% of Production	1981.7	2013.7	2013.7	2013.7	1981.7	1988.1	1956.1	1911.4	1834.7	1713.2	1579.0	1470.3	1374.4	1297.7
Cup Lump Revenue: 40% of Production	1056.9	1074.0	1074.0	1074.0	1056.9	1060.3	1043.3	1019.4	978.5	913.7	842.1	784.2	733.0	692.1
TOTAL REVENUE	3038.6	3087.6	3087.6	3087.6	3038.6	3048.4	2999.4	2930.8	2813.2	2626.9	2421.1	2254.4	2107.4	1989.8
COSTS OF PRODUCTION														
*Land Clearing Materials, K/ha														
*Terracing, K/ha														
*Field Development & Oper'ns:														
-Polyclonal Seedlings, K/ha	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2	112.2
-Polyclonal Seedlings	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2
-Budded Seedlings, K/ha	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7	113.7
-Budded Seedlings, K/ha	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1	142.1
Total Area														
Total Materials Cost	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9	339.9
*Field Transport, K/tonne	77.5	78.8	78.8	78.8	77.5	77.8	76.5	74.8	71.8	67.0	61.8	57.5	53.8	50.8
TOTAL COSTS	417.4	418.7	418.7	418.7	417.4	417.7	416.4	414.7	411.7	406.9	401.7	397.4	393.7	390.7
CASH FLOW	2621.2	2668.9	2668.9	2668.9	2621.2	2630.7	2583.0	2516.1	2401.5	2220.0	2019.4	1857.0	1713.7	1599.1
* FRR:														

2.1 LETTUCE GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour
3. Analysis includes direct costs and returns only

GROSS RECEIPTS:-

Yield Tonnes/ha			14.00	18.00	22.00
Price Kina/kg	(paid 'at	gate')	0.35	0.35	0.35
Gross Revenue			\$4,900	\$6,300	\$7,700

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Seed	50.00	2.00	kg	100.00	100.00	100.00
Insecticide : Malathion	2.00	35.00		70.00	70.00	70.00
Fungicide : Dithane	6.00	25.00		150.00	150.00	150.00
Fertilizer : 12:12:17	0.50	504.00	tonne	252.00	252.00	252.00
Packaging boxes	560	0.50	25 kg	280.00		
(field uses 4 times)	720	0.50	25 kg		360.00	
	880	0.50	25 kg			440.00
Direct Costs/ha (excluding transport)				\$852	\$932	\$1,012

GROSS MARGIN PER TONNE	\$289	\$298	\$304
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GROSS MARGIN PER HECTARE	\$4,048	\$5,368	\$6,688
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LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting	55	55	55
Hand weeding	10	10	10
Insecticides/chem.	54	54	54
Fertilizer application	15	15	15
Harvesting, bagging and transfer to point of sale	20	24	28
TOTAL PERSONDAYS	224	228	232

GROSS MARGIN PER PERSONDAY	\$18.07	\$23.54	\$28.83
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Persondays per 0.1 hectares	22.4	22.8	23.2
Gross Margin per 0.1 hectares	\$405	\$537	\$669

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne	260.00	290.00	320.00	350.00	380.00	410.00
14 tonnes/ha	2,788	3,208	3,628	4,048	4,468	4,888
18 tonnes/ha	3,748	4,288	4,828	5,368	5,908	6,448
22 tonnes/ha	4,708	5,368	6,028	6,688	7,348	8,008

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

2.2 TOMATOES GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour and hired tractor
3. Analysis includes direct costs and returns only

GROSS RECEIPTS:-

Yield Tonnes/ha		18	24	30
Price Kina/kg	(paid 'at gate')	0.55	0.55	0.55
Gross Revenue		\$9,900	\$13,200	\$16,500

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Seed (no plants)	50.00	3.00	kg	150.00	150.00	150.00
Fertilizer :	0.40	500.00	tonne	200.00	200.00	200.00
12:12:17						
Insecticide :	4.00	25.00	ha	100.00	100.00	100.00
Malathion						
Fungicide	4.00	25.00	ha	100.00	100.00	100.00
Stakes and ties	0.00	0.00		0.00	0.00	0.00
Packaging boxes	18,000	0.06	per kg	1080.00		
Used 4 times	24,000	0.06	per kg		1440.00	
	30,000	0.06	per kg			1800.00
Direct Costs/ha (excluding transport)				\$1,630	\$1,990	\$2,350

GROSS MARGIN PER TONNE	\$459	\$467	\$472
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GROSS MARGIN PER HECTARE	\$8,270	\$11,210	\$14,150
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LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting	15	15	15
Staking and tying	10	10	10
Insecticide/fungicide spraying	200	200	200
Fertilizer application	25	25	25
Hand weeding	10	10	10
Harvesting, bagging and transfer to point of sale	170	200	230
TOTAL PERSONDAYS	500	530	560

GROSS MARGIN PER PERSONDAY	\$16.54	\$21.15	\$25.27
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Persondays per 0.1 hectares	50.0	53.0	56.0
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Gross Margin per 0.1 hectares	\$827	\$1,121	\$1,415
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PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne	400.00	450.00	500.00	550.00	600.00	650.00
18 tonnes/ha	5,570	6,470	7,370	8,270	9,170	10,070
24 tonnes/ha	7,610	8,810	10,010	11,210	12,410	13,610
30 tonnes/ha	9,650	11,150	12,650	14,150	15,650	17,150

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

2.3 CAULIFLOWER GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour
3. Analysis includes direct costs and returns only

GROSS RECEIPTS:-

Yield Tonnes/ha			8.00	20.00	40.00
Price Kina/kg	(paid 'at	gate')	0.40	0.40	0.40
Gross Revenue			\$3,200	\$8,000	\$16,000

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Seed (no plants)	3.00	50.00	ha	150.00	150.00	150.00
Fertilizer 12:12:17	0.40	504.00	tonne	201.60	201.60	201.60
Triple super	0.25	405.00	tonne	101.25	101.25	101.25
Insecticide	1.00	74.00	ha	74.00	74.00	74.00
Packaging bags	160	0.50	50 kg	80.00		
	400	0.50	50 kg		200.00	
	800	0.50	50 kg			400.00
Direct Costs/ha (excluding transport)				\$607	\$727	\$927

GROSS MARGIN PER TONNE

\$324 \$364 \$377

GROSS MARGIN PER HECTARE

\$2,593 \$7,273 \$15,073

LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting out	30	30	30
Insecticide spraying	48	48	48
Fertilizer application	15	15	15
Hand weeding	10	10	10
Infilling	7	7	7
Harvesting, bagging and transfer to point of sale	22	27	33
TOTAL PERSONDAYS	202	207	213

GROSS MARGIN PER PERSONDAY

\$12.84 \$35.14 \$70.77

Persondays per 0.1 hectares

20.2 20.7 21.3

Gross Margin per 0.1 hectares

\$259 \$727 \$1,507

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne	310.00	340.00	370.00	400.00	430.00	460.00
8 tonnes/ha	1,873	2,113	2,353	2,593	2,833	3,073
20 tonnes/ha	5,473	6,073	6,673	7,273	7,873	8,473
40 tonnes/ha	11,473	12,673	13,873	15,073	16,273	17,473

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

2.4 BROCOLLI GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour and hired tractor
3. Analysis includes direct costs and returns only

GROSS RECEIPTS:-

Yield Tonnes/ha		10.00	15.00	20.00
Price Kina/kg	(paid 'at gate')	0.75	0.75	0.75
Gross Revenue		\$7,500	\$11,250	\$15,000

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Seed (no plant)	3.00	50.00	kg	150.00	150.00	150.00
Fertilizer	0.25	405.00		101.25	101.25	101.25
Insecticide	1.00	50.00	ha	50.00	50.00	50.00
Packaging bags	200	0.50	50 kg	100.00	0.00	0.00
	300	0.50	50 kg	150.00	0.00	0.00
	400	0.50	50 kg	200.00	0.00	0.00
Direct Costs/ha (excluding transport)				\$751	\$301	\$301
GROSS MARGIN PER TONNE				\$675	\$730	\$735
GROSS MARGIN PER HECTARE				\$6,749	\$10,949	\$14,699

LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting out	30	30	30
Insecticide spraying	48	48	48
Hand weeding	10	10	10
Infilling	7	7	7
Harvesting, bagging and transfer to point of sale	22	27	33
TOTAL PERSONDAYS	187	192	198
GROSS MARGIN PER PERSONDAY	\$36.09	\$57.02	\$74.24
Persondays per 0.1 hectares	18.7	19.2	19.8
Gross Margin per 0.1 hectares	\$675	\$1,095	\$1,470

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne	660.00	690.00	720.00	750.00	780.00	810.00
10 tonnes/ha	0	0	0	0	0	0
15 tonnes/ha	0	0	0	0	0	0
20 tonnes/ha	0	0	0	0	0	0

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

2.5 ENGLISH CABBAGE GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour and tractor hire
3. Analysis includes direct costs and returns only

GROSS RECEIPTS:-

Yield Tonnes/ha			30.00	50.00	70.00
Price Kina/kg	(paid 'at	gate')	0.18	0.18	0.18
Gross Revenue			\$5,400	\$9,000	\$12,600

DIRECT COST:-

	Quantity or No.	Cost per Unit(Kina)	Unit			
Seed (no plants)	3.00	50.00	kg	150.00	150.00	150.00
Fertilizer:Triphos	0.33	405.00		133.65	133.65	133.65
Insecticide	2.50	35.00	ha	87.50	87.50	87.50
Packaging bags	300.00	0.50	50 kg	150.00		
used twice	500.00	0.50	50 kg		250.00	
	700.00	0.50	50 kg			350.00
Direct Costs/ha (excluding transport)				\$521	\$621	\$721
GROSS MARGIN PER TONNE				\$163	\$168	\$170
GROSS MARGIN PER HECTARE				\$4,879	\$8,379	\$11,879

LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting out	30	30	30
Insecticide spraying	48	48	48
Fertiliser	15	15	15
Hand weeding	10	10	10
Infilling	7	7	7
Harvesting, bagging and transfer to point of sale	22	27	33
TOTAL PERSONDAYS	202	207	213
GROSS MARGIN PER PERSONDAY	\$24.15	\$40.48	\$55.77
Persondays per 0.1 hectares	20.2	20.7	21.3
Gross Margin per 0.1 hectares	\$488	\$838	\$1,188

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne	140.00	160.00	180.00	200.00	220.00	240.00
30 tonnes/ha	0	0	0	0	0	0
50 tonnes/ha	0	0	0	0	0	0
70 tonnes/ha	0	0	0	0	0	0

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

2.6 CARROTS GROSS MARGIN

- Assumptions:-
1. Unpaid family labour for all manual operations
 2. Cultivation using family labour and hired tractor
 3. Analysis includes direct costs and returns only

Note : Carrots are all grown in small plots

GROSS RECEIPTS:-

Yield Tonnes/ha		12.00	18.00	22.00
Price Kina/kg	(paid 'at gate')	0.42	0.42	0.42
Gross Revenue		\$5,040	\$7,560	\$9,240

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Cultivation	4.00	60.00	ha	240.00	240.00	240.00
Seed (no plants)	4.00	40.00	kg	160.00	160.00	160.00
Insecticide:Malath'n	2.00	35.00		70.00	70.00	70.00
Fungicide	2.00	25.00		50.00	50.00	50.00
Fertilizer 12:12:17	0.25	504.00	tonne	126.00	126.00	126.00
Packaging bags	600.00	0.25	20 kg bag	150.00		
	900.00	0.25	20 kg bag		225.00	
	1100.00	0.25	20 kg bag			275.00
Direct Costs/ha (excluding transport)				\$796	\$871	\$921

GROSS MARGIN PER TONNE \$354 \$372 \$378

GROSS MARGIN PER HECTARE \$4,244 \$6,689 \$8,319

LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting seed	30	30	30
Insecticides etc..	38	38	38
Fertilizer application	15	15	15
Hilling	10	10	10
Harvesting, bagging and transfer to point of sale	48	55	62
TOTAL PERSONDAYS	211	218	225

GROSS MARGIN PER PERSONDAY \$20.11 \$30.68 \$36.97

Persondays per 0.1 hectares 21.1 21.8 22.5

Gross Margin per 0.1 hectares \$424 \$669 \$832

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne:-	330.00	360.00	390.00	420.00	470.00	520.00	570.00
12 tonnes/ha	3,164	3,524	3,884	4,244	4,844	5,444	6,044
18 tonnes/ha	5,069	5,609	6,149	6,689	7,589	8,489	9,389
22 tonnes/ha	6,339	6,999	7,659	8,319	9,419	10,519	11,619

SOURCE: FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

2.7 WARE (TABLE) POTATOES GROSS MARGIN

Assumptions:-

1. Unpaid family labour for all manual operations
2. Cultivation using family labour and hired tractor
3. Analysis includes direct costs and returns only
4. Small potato price average of seed and reject price

GROSS RECEIPTS:-

Yield Tonnes/ha		10.00	15.00	20.00
Price Kina/kg	(paid 'at gate')	0.25	0.25	0.25
Gross Revenue		\$2,500	\$3,750	\$5,000

DIRECT COST:-

	Quantity or No.	Cost per Kina	Unit			
Cultivation	4.00	60.00	ha	240.00	240.00	240.00
Seed	2.00	670.00	tonne	1340.00	1340.00	1340.00
Insecticides: Ambush	5.00	30.00	ha	150.00	150.00	150.00
Fungicide : Bravo	5.00	60.00	ha	300.00	300.00	300.00
Fertilizer 12:12:17	0.75	504.00	tonne	378.00	378.00	378.00
Triple super	0.25	405.00	tonne	101.25	101.25	101.25
Packaging bags	200.00	0.50	50 kg bag	100.00		
	300.00	0.50	50 kg bag		150.00	
	400.00	0.50	50 kg bag			200.00
Direct Costs/ha (excluding transport)				\$2,609	\$2,659	\$2,709

GROSS MARGIN PER TONNE (\$11) \$73 \$115

GROSS MARGIN PER HECTARE (\$109) \$1,091 \$2,291

LABOUR REQUIREMENTS:- (Persondays)

Land preparation	70	70	70
Planting seed	30	30	30
Insecticide/fungicide spraying	96	96	96
Fertilizer application	19	19	19
Hilling potatoes	10	10	10
Harvesting, bagging and transfer to point of sale	23	28	33
TOTAL PERSONDAYS	248	253	258

GROSS MARGIN PER PERSONDAY (\$0.44) \$4.31 \$8.88

Persondays per 0.1 hectares 24.8 25.3 25.8

Gross Margin per 0.1 hectares (\$11) \$109 \$229

PRICE SENSITIVITY: (Based on Gross Margin per hectare)

Kina per tonne:-	160.00	190.00	200.00	250.00	280.00	310.00	340.00
(weighted price)							
10 tonnes/ha	(1,009)	(709)	(609)	(109)	191	491	791
15 tonnes/ha	(259)	191	341	1,091	1,541	1,991	2,441
20 tonnes/ha	491	1,091	1,291	2,291	2,891	3,491	4,091

SOURCE : FIGURES UPDATED FROM 1987 REVIEW OF FRESH PRODUCE DEVELOPMENT CO. MT. HAGEN

N.B. Assumes all recommended fertiliser and chemical treatments carried out.

3.1 SMALLSCALE CATTLE RANCH - BUDGET AND CASHFLOW

PROJECT UNIT SIZE (ha)	300	450	600	750
LIVESTOCK NOS. & TRADING DETAILS:-				
Breeding bulls	2	3	4	5
Deaths and losses	0	0	0	0
Cull bulls	2	2	2	2
Replacements for above	2	2	2	2
Closing stock bulls	2	3	4	5
Breeding cows	54	81	108	135
Deaths and losses	1	1	2	2
Cull cows	5	8	11	13
Regraded in heifers	6	9	12	15
Closing stock cows	54	81	108	135
Calves born males and females	31	47	63	78
Deaths and losses	1	1	1	2
Closing stock males & females calves	31	46	61	77
Heifers 1-2 years old	15	23	31	38
Deaths and losses	0	0	0	1
Reared for replacements	6	9	12	15
Surplus heifers sold	9	13	18	22
Closing stock	6	9	12	15
Heifers 2-3 years old	6	9	12	15
Deaths and losses	0	0	0	0
Closing stock	6	9	12	15
Heifers 3-4 years old	6	9	12	15
Regraded to cows	6	9	12	15
Closing stock	0	0	0	0
Steers 1-2 years old	15	23	31	38
Deaths and losses	0	0	0	1
Closing stock	15	23	30	38
Steers 2-3 years old	15	23	30	38
Deaths and losses	0	0	0	1
Selected sales	1	2	3	4
Closing stock	13	20	27	34
Steers 3-4 years old	13	20	27	34
Deaths and losses	0	0	0	1
Sales as fully grown	13	20	26	33
Closing stock	0	0	0	0
TOTAL HERD PER MODEL RANCH UNIT	120	180	240	300
Carrying capacity (low density)Ha/AU	2.5	2.5	2.5	2.5

LIVESTOCK SCHEDULES (337 Ha)

TABLE 1 OF 3

PROJECT UNIT SIZE (ha)	YEAR 1-4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15
	337	337	337	337	337	337	337	337	337	337	337	337
HERD COMPOSITION:-												
Breeding bulls	3	3	3	3	3	3	3	3	3	3	3	3
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Cull bulls		0	0	0	0	0	0	0	0	0	0	0
Replacement for above		0	0	0	0	0	0	0	0	0	0	0
Closing stock bulls		3	3	3	3	3	3	3	3	3	3	3
Closing stock cows		64	64	64	64	64	64	64	64	64	64	64
Deaths and losses		1	1	1	1	1	1	1	1	1	1	1
Cull cows		6	6	6	6	6	6	6	6	6	6	6
Regraded in heifers		7	7	7	7	7	7	7	7	7	7	7
Closing stock cows		64	64	64	64	64	64	64	64	64	64	64
Calves born males and females		37	37	42	42	42	42	42	42	42	42	42
Deaths and losses		1	1	1	1	1	1	1	1	1	1	1
Closing stock males and females calves		36	36	41	41	41	41	41	41	41	41	41
Heifers 1-2 years old		18	18	20	20	20	20	20	20	20	20	20
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Rearred for replacements		7	7	7	7	7	7	7	7	7	7	7
Surplus heifers sold		11	11	13	13	13	13	13	13	13	13	13
Closing stock		7	7	7	7	7	7	7	7	7	7	7
Heifers 2-3 years old		6	6	6	6	6	6	6	6	6	6	6
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Closing stock		6	6	6	6	6	6	6	6	6	6	6
Heifers 3-4 years old		6	6	6	6	6	6	6	6	6	6	6
Regraded to cows		6	6	6	6	6	6	6	6	6	6	6
Closing stock		6	6	6	6	6	6	6	6	6	6	6
Steers 1-2 years old	58	18	18	20	20	20	20	20	20	20	20	20
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Closing stock		18	18	20	20	20	20	20	20	20	20	20
Steers 2-3 years old		18	18	20	20	20	20	20	20	20	20	20
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Selected sales		2	2	2	2	2	2	2	2	2	2	2
Closing stock		16	16	18	18	18	18	18	18	18	18	18
Steers 3-4 years old		16	16	18	18	18	18	18	18	18	18	18
Deaths and losses		0	0	0	0	0	0	0	0	0	0	0
Sales as fully grown		16	16	18	18	18	18	18	18	18	18	18
Closing stock		0	0	0	0	0	0	0	0	0	0	0
TOTAL HERD		141	141	148	148	148	148	148	148	148	148	148
Carrying capacity (low density) Ha/AU		2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
LIVESTOCK SALES:-												
Cull bulls @ 250 Kg edw K1.20/Kg		77	77	77	77	77	77	77	77	77	77	77
Cull cows 231 Kg edw K1.20/Kg		1,748	1,748	1,748	1,748	1,748	1,748	1,748	1,748	1,748	1,748	1,748
Heifers 1-2 years Live @ K190/head		2,025	2,025	2,436	2,436	2,436	2,436	2,436	2,436	2,436	2,436	2,436
Steer Ranch bred 2-3 yrs 240 Kg edw K1.73/Kg		733	733	822	822	822	822	822	822	822	822	822
Steers Ranchbred 3-4 yrs 240 Kg edw K1.73/Kg		6,499	6,499	7,283	7,283	7,283	7,283	7,283	7,283	7,283	7,283	7,283
TOTAL VALUE SALE(KINA)		11,082	11,082	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365

TABLE 2 OF 3

YEAR 5-ON	6	7	8	9	10	11	12	13	14	15	16
OPERATING COSTS:-											
Salaries and Wages:											
Ranch manager K8,860 per annum											
Head stockmen K4,360 per annum											
Cowboys @ K1,560 per annum											
Sub-total [MANAGED BY FAMILY LABOUR]	0	0	0	0	0	0	0	0	0	0	0
Animal health and Vet supplies:											
Mineral licks K1.00 per AU/annum	141	141	148	148	148	148	148	148	148	148	148
Vet supplies K0.75 per AU per annum	90	106	111	111	111	111	111	111	111	111	111
Sub-total	231	247	260	260	260	260	260	260	260	260	260
Machinery consumables:											
Fuel and oil (diesel tractor)											
Fuel and oil (4x4 vehicle)											
Fuel and oil (water pump)											
Sub-total: [NO MACHINERY USED]	0	0	0	0	0	0	0	0	0	0	0
Repairs and maintenance:											
Tractor 1000 hrs per annum @K 1.50 per hr											
Tractor repairs 10% of new value											
Vehicle repairs 10% of new value											
Water pump 5% of value											
tractor tyres one set/1000hrs price											
Tyres vehicle one set/40000km											
Slasher 15% of value	455	963	963	963	963	963	963	963	963	963	963
Pastures improvements	639	626	626	626	626	626	626	626	626	626	626
Fences 5% of value	0										
Tools 20% of value	264	251	251	251	251	251	251	251	251	251	251
Stock handling yards 5% of value											
Trailer repairs and tyres											
Ranch buildings 2.5% of value.											
Sub-total	1,358	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840
General Overheads:											
Livestock freight to abattoir	1,108	1,237	1,237	1,237	1,237	1,237	1,237	1,237	1,237	1,237	1,237
Administrative overheads 5%	135	166	167	167	167	167	167	167	167	167	167
Breeding bull replacement costs	221	221	221	221	221	221	221	221	221	221	221
Sub-total	1,464	1,624	1,624	1,624	1,624	1,624	1,624	1,624	1,624	1,624	1,624
TOTAL OPERATING COSTS	3,053	3,710	3,724	3,724	3,724	3,724	3,724	3,724	3,724	3,724	3,724
COST PER ANIMAL UNIT	22	25	25	25	25	25	25	25	25	25	25

TABLE 3 OF 3

CAPITAL COSTS:-

YEAR	1-4	5	6	7	8	9	10	11	12	13	14	15
Fencing:												
Fencing Boundary (area/100) = Km	3											
Cost = (Km x 1000 x 4 strands x K82)/400 m	2,763											
Star Pickets = (Km x 1000/10 spacing x cost 4.70)	1,584											
Braces = (Km x 1000/50mx @ K 6.50)	438											
Division Fencing (Km x 2 x 1000 x 367/400m)	847											
Star pickets = (Km x 1000/10 x cost 4.70)	1,584											
Tie Wire = 2% of Material cost	144											
Tie Wire 12G = 1.75% of Material Cost	129											
Cattle Holding yards:												
Bought materials 6sqm/AU @ K5/sqm	4,230											
Bush materials	1,058											
Water Supply:												
Water tank 1500 litres cw/structure												
PVC pipes size 132 by 200 meters												
Cement 50 Kg bags 10 bags												
Pipe fittings 5% of material cost												
Management Items:												
Initial Heifers = area/cpx 39%	12,090											
Breeding bulls = (Cow x 20)	1,971											
Horses allow 4	1,400											
Machinery and Equipment:												
Tractor												
Trailer												
Slasher												
Water pump												
Vehicle												
Bore hole drilling												
Staff housing												
Manager's house												
Labour houses												
Establishment Costs												
Fencing labour = (Km * 10md/km * 4.60/day)												
Cattle yards 14 days/men * 4.60												
Contingencies 5%												
TOTAL CAPITAL COSTS	32,223	11,082	11,082	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365
GROSS SALES:-												
Off ranch income- owners equity												
Ranch equipment hire (tractor and trailer)												
GROSS INCOME (KINA)												
NET CASH FLOW												
NPV @ 10.00%	\$31,622	11,480	11,082	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365	12,365
Internal Rate of Return	33.8%	7,905	7,371	8,641	8,641	8,641	8,641	8,641	8,641	8,641	8,641	8,641

SOURCE: D.A.L. ERAP, LAE.

3.2 LARGEHOLDER CATTLE RANCH: MODEL ANNUAL BUDGET

Adapted from Livestock Development Corporation information.

LIVESTOCK TRADING ACCOUNT :-

Animal Classes	Opening Number	CSU Per Head	Total CSU	Closing Number	Value per head (Kina)	Total L/stock Capital
Cows	1,020	1.0	1,020	1,020	250	255,000
Breeding R3	340	1.0	340	340	350	119,000
Steers R1	476	0.4	190	476	180	85,680
R2	466	0.8	373	466	350	163,100
R3	460	1.0	460	460	450	207,000
Heifers R1	476	0.35	167	476	160	76,160
R2	466	0.7	326	466	250	116,500
R3	125	1	125	125	320	40,000
Bulls	56	1.4	78	56	420	23,520
	<u>3,885</u>		<u>3,079</u>	<u>3,885</u>		<u>1,085,960</u>

<u>Purchases</u>		<u>Sales</u>	No.	K/Hd	Total
Bulls	6 <u>\$4,800</u>	Cull Cows	319	260	82,940
		Steers	460	420	193,200
		Bulls	5	570	2,850
		Heifers	125	380	47,500
		Horses etc..			3,900
			<u>909</u>	K	<u>330,390</u>

Births (70%)

		<u>Deaths</u>	
Male	476	Cull Cows	21
Female	<u>476</u>	Steers	16
	952	Bulls	1
		Heifers	11
			<u>49</u>
	<u>4,843</u>		<u>4,843</u>

::

	<u>TOTAL</u>	<u>PER CSU</u>
GROSS INCOME	330,390	107.29
LESS:		
LIVESTOCK PURCHASES	<u>4,800</u>	<u>1.56</u>
NET INCOME:	<u>\$325,590</u>	<u>\$105.73</u>

<u>EXPENDITURE:-</u>	<u>TOTAL</u>	<u>PER CSU</u>
General Costs	10,000	3.25
Fuel & Oil	8,000	2.60
Land Rent	25,903	8.41
Maintenance	10,000	3.25
Vet Expenses	2,500	0.81
Vehicle expenses	5,000	1.62
Sundries	15,000	4.87
Wages	30,000	9.74
Bank Fees	1,500	0.49
Accountancy Audit	3,000	0.97
Insurance	2,000	0.65
Power	2,000	0.65
Salaries	25,000	8.12
Taxgrp Tax	1,200	0.39
Staff Amenities	1,000	0.32
Postage/Stationary	500	0.16
Superannuation	1,875	0.61
Telephone	3,000	0.97
Travel	2,000	0.65
Interest on W.Expenses	2,055	0.67
Depreciation	10,000	3.25
TOTALS:	<u>\$161,533</u>	<u>\$52.46</u>
PROFIT BEFORE TAXATION	<u>164,057</u>	<u>\$53.28</u>

Profit before taxation must cover the following items:-

	<u>ESTIMATED:</u>	<u>PER CSU</u>
Taxation	27,831	9.04
Capital purchases	13,500	4.38
Development	15,000	4.87
Principal repayment	12,000	3.90
Interest on debt	9,900	3.21
NET SURPLUS:	<u>\$92,783</u>	<u>\$30.13</u>
ADD: Depreciation (non cash)	10,000	
NET CASH SURPLUS:	<u>\$102,783</u>	<u>\$33.38</u>

COST OF PRODUCTION: CATTLE

Based on LDC Data (above average performance)

1,360 Breeding cows
3,233 Cattle stock units
75% Calving (above average)
Year round calving

SALES: 1994 Forecast

	Number	KG/Head	Total Kg
Cull cows	311	200	62,200
Steers	500	240	120,000
Heifers	159	210	33,390
Bulls	5	300	1,500
	<u>975</u>		<u>217,090</u>

<u>TOTAL</u>	<u>PER CSU</u>	<u>TOEA/KG</u>	
10,000 General Cost:	3.09	4.61	
8,000 Fuel & Oil	2.47	3.69	
25,903 Land Rent Adjustme	8.01	11.93	
0 Leasing Costs	0.00	0.00	
10,000 Maintenance	3.09	4.61	
2500.00 Vet Expenses	0.77	1.15	
5,000 Vehicle Expenses	1.55	2.30	
15,000 Sundries	4.64	6.91	
30,000 Wages	9.28	13.82	
5,500 Bank Fees	1.70	2.53	
3,000 Accountancy Audit	0.93	1.38	
2,000 Insurance	0.62	0.92	
2,000 Power	0.62	0.92	
25,000 Salaries	7.73	11.52	
1,200 Taxgrp Tax	0.37	0.55	
1,000 Staff Amenities	0.31	0.46	
500 Postage/Stationery	0.15	0.23	
0 Superannuation	0.00	0.00	
3,000 Telephone	0.93	1.38	
0 Travel	0.00	0.00	
1,870 Interest on W.Exp	0.58	0.86	
10,000 Depreciation	3.09	4.61	
<u>K161,473</u>	<u>K49.95</u>	<u>74.38</u>	Toea/Kg

3.3 CATTLE SMALLHOLDER BUDGET: Breeding and finishing.

Assumptions:-

Breeding own replacements
 Calving 70 % Survival to weaning
 Mortality 2% calves
 1.5 % adults
 Replacements 15%
 Unimproved pastures

LIVESTOCK TRADING ACCOUNT:

	<u>Opening Numbers</u>	<u>C.S.U.</u>	<u>Total C.S.U.</u>	<u>Closing Numbers</u>	<u>CAPITAL VALUES</u>	
					<u>Per head</u>	<u>Total</u>
MA Cows	20	1.00	20.0	20	300	6,000
R2 Heifers	7	0.70	4.9	7	250	1,750
R1 Heifers	7	0.35	2.5	7	180	1,260
R2 Steers	6	0.80	4.8	6	300	1,800
R1 Steers	7	0.40	2.8	7	200	1,400
Bull	1	1.00	1.0	1	500	500
	<u>48</u>		<u>35.95</u>	<u>48.00</u>		<u>K12,710</u>

PURCHASES:

Total SALES:

	<u>Number</u>	<u>K/Head</u>	<u>Total</u>
Share of bull	K200 Cull cows	3	260.00
(every 4 years)	R3 Heifers	3	340.00
	R3 Sreers	6	380.00
Totals:	<u>K200 Totals:</u>	<u>12</u>	<u>K4,080</u>

BIRTHS:

Number

DEATHS:

Number

Calves	14	R1 Sterrs	1
		Cows	1
	<u>14</u>		<u>2</u>
CHECK TOTALS:	<u>62</u>		<u>62</u>

NOTE: C.S.U. = Cattle Stock Units

GROSS INCOME FROM SALES:

K4,080

Less: Share of bull purchase

K200

INCOME NET OF LIVESTOCK PURCHASES:

K3,880

VARIABLE COSTS:

	<u>Number</u>	<u>Cost/unit</u>	<u>Unit</u>	<u>Total Kina</u>
Drench	n/a			0.00
Dipping/tick grease	n/a			0.00
Screw worm treatment	48	\$1.50	per/hd	72.00
Salt blocks	20	\$12.00	/block	240.00
Freight	12	\$20.00	per/hd	240.00
Total Variable Costs:				<u>K552.00</u>

TOTAL GROSS MARGIN

K3,328.00

GROSS MARGIN / COW

K166.40

GROSS MARGIN / C.S.U.

K92.57

FIXED COSTS:

	<u>Kina</u>
Repairs & maintenance to fencing	200
Labour @ 180 man days/year @ K4.50 / day	810
Interest on total capital @ 5% (real)	0
Depreciation on fixed assets	403
Total Fixed Costs:	<u>K2,309</u>

PROFIT (net of interest & deprn)

K1,019

PROFIT (NOT net of interest) (A)

k1,915

GROSS MARGIN PER PERSON DAY

K19.49

RETURN ON LIVESTOCK CAPITAL (A / B)

15.1%

RETURN ON TOTAL CAPITAL (A / C)

10.7%

CAPITAL COSTS:

	<u>Kina</u>
Livestock capital	12,710 (B)
Fencing	3,500
Yards	1,500
Small tools	150
Wire strainer	50
Sub-Total:	5,200
TOTAL CAPITAL:	<u>K17,910</u> (C)

NOTES:

No maintenance fertiliser, unimproved pasture @ 0.5 C.S.U./Ha

Total area fenced is 72 Hectares

Assume natural water supply available.

GROSSMARGIN SENSITIVITY ANALYSIS:

GROSS MARGIN / COW		CHANGE TO BEEF PRICES				
		-20%	-10%	Model	+10%	+20%
CALVING PERCENTAGE	50%	82.27	95.33	108.40	121.47	134.53
	60%	125.67	125.67	142.40	159.13	175.87
	70%	0.00	0.00	0.00	0.00	0.00
	80%	162.27	186.33	210.40	234.47	258.53
	90%	188.93	216.67	244.40	272.13	299.87

SOURCE: D.A.L., LABU AGRICULTURE EXPERIMENT STATION

3.4 GOAT GROSS MARGIN

SMALLHOLDER BREEDING AND FATTENING UNIT
AT STEADY STATE. BREEDING OWN REPLACEMENT.

ASSUMPTIONS:-

1. KIDDING : 100 %
2. MORTALITY: KIDS 5 %
ADULTS 3 %
3. REPLACEMENT RATE: EWES 20 %
BILLY EVERY 3 YEARS
4. STOCKING RATE: NATURAL 10 HEAD/HA
PASTURES
5. SALES: ALL SALES AT FARMGATE PRICES.
FAT WETHERS SOLD @ K50.00
CULL DOES SOLD @ K50.00
CULL BILLY SOLD @ K30.00
NO FIBRE SALES
6. GRAZING SYSTEM: FREE RANGE GRAZING DURING DAYTIME. AT NIGHT
CONFINEMENT IS SHED COMBINED WITH SET STOCKING
IN 1 HA Paddock.

LIVESTOCK TRADING ACCOUNT:-

	OPENING NUMBERS	S.S.U	T.S.U	CLOSING NUMBERS	KINA PER HEAD	TOTAL KINA
1. DOES	10	1	10	10	40	400
2. DOE HOGGETS	5	0.7	3.5	5	40	200
3. WETHER HOGGETS	4	0.8	3.2	4	30	120
4. BILLIES	1	0.8	0.8	1	40	40
	20		17.5	20		K760

Note: Of the 5 doe hoggets, 2 are retained for breeding and 3 are sold.

	PURCHASES	K/HEAD	TOTAL	SALES	KINA PER HEAD	TOTAL KINA
1. DOES	0			2	50	100
2. DOE HOGGETS	0			3	50	150
3. WETHER HOGGETS	0			4	50	200
4. BILLY (1/3)	0.33	60	20	0.33	30	10
	0.33		20	9.33		K460

	<u>BIRTHS</u>	<u>DEATHS</u>
KIDS	10	0
ADULTS	N/A	1
	10	1
TOTALS:	30.33	30.33

NOTE: G.S.U. = Goat Stock Unit

T.S.U. = Total Stock Units

<u>INCOME:-</u>	<u>TOTAL (K)</u>	<u>PER S.U.</u>
GROSS INCOME SALES	460.00	26.29
less: BILLY PURCHASE	20.00	1.14
NET INCOME:	<u>K440.00</u>	<u>(A) K25.14</u>
<u>VARIABLE COSTS</u>	<u>TOTAL (K)</u>	<u>PER S.U.</u>
1. FEED SUPPLEMENT	0.00	0
2. DRENCHS : APPLIED ONCE/YEAR		
ADULTS 10 MLS/HEAD @ 0.05 TOEA/ML	5.50	0.31
HOGGETS 7.5 MLS/HEAD @ 0.05 TOEA/ML	3.38	0.19
KIDS 5 MLS/HEAD @ 0.05 TOEA/ML	2.50	0.14
3. SCREW WORM SMEAR		
1 KG/YEAR @ K10.00/KG	10.00	0.57
4. SALT LICK		
3 BLOCKS/YEAR @ K10.00/BLOCK	30.00	1.71
5. SUNDRIES	10.00	0.57
TOTAL VARIABLE COST	<u>K61.38</u>	<u>K3.51</u>
TOTAL GROSS MARGIN	<u>K378.62</u>	<u>(A - B)</u>
GROSS MARGIN/G.S.U		K21.64
RETURN/MANDAY (63 MD/YR)	K6.01	

SENSITIVITY ANALYSIS:-

GROSS MARGIN /STOCK UNIT		% KIDDING		
		90.0%	100.0%	110.0%
KINA	K40.00	15.92	17.52	19.12
PER	K50.00	20.78	21.64	24.78
HEAD	K60.00	25.64	28.04	30.44

SOURCE : D.A.L, LABU RESEARCH CENTRE, LAE.

3.5 SMALLHOLDER SHEEP GROSS MARGIN

Highlands Model

TRADING ACCOUNT:

	Opening numbers	SSU	Closing numbers	CAPITAL VALUES	
				K/head	Total (k)
Ewes	10	10	10	40.00	400.00
Ewe hoggets	2	1.4	2	40.00	80.00
Wether hoggets	5	4	5	50.00	250.00
Rams	1	0.8	1	35.00	35.00
	18	16.2	18		K765.00

	Purchases	Sales	K/head	Total (k)
Cull ewes	0	2	70.00	140.00
Ewe hogg's	0	2	40.00	80.00
Wethers	0	5	70.00	350.00
	0	9		K570.00 (A)

Births

Lambing	100.0%	10
		10
TOTALS:		28

Deaths

	1
	1
	28

WOOL SALES:	Number	Kg/head	Total Kg	Kina/Kg	Total (K)
Ewes	10	2.5	25.0	1.00	25.00
Ewe hoggets	2	2.0	4.0	1.00	4.00
Wethers	5	2.0	10.0	1.00	10.00
Rams	1	3.0	3.0	1.00	3.00
			42.00		K42.00 (B)
			TOTAL INCOME		K612.00 (A+B)

Variable costs:

			Cost/unit	Total (K)
Feed		nil		
Drench-	Nilverm injectable			
	Adults 10ml/head	monthly	K98.95/l	11.87
	Hoggets 7.5ml/head	monthly		8.90
	Lambs 5ml/head	monthly		5.94
Salt blocks-				
	1 for every 6 sheep	(6 blocks) 6 monthly	K12.60/blk	75.60
		Total variable costs		K102.31 (C)
		Total gross margin		K509.69
		G.M. per sheep stock unit.....		K31.46

RETURN ON LIVESTOCK CAPITAL: (N.B. No fixed costs deducted) 66.6%

RETURN PER MAN DAY Man days 91 G.M. per man day K5.60

CAPITAL EQUIPMENT:

Fencing wire 50 metre rolls	No.8 wire	K45.00
	No.6 wire	K36.50
Shearing blades per pair		K23.45
Drenching gun (or vaccine gun)		K67.00
Local materials for housing and fencing.		

SENSITIVITY ANALYSIS:

GROSS MARGIN PER SSU:		Lambing %		
		80%	100%	120%
Wool	2.50	26.15	31.46	36.77
weight	3.00	29.26	34.57	39.88
Kg/ssu	3.50	29.79	35.09	40.40

GROSS MARGIN PER SSU:		Lamb price (K per head)		
		30.00	40.00	50.00
Wool	1.00	11.36	16.38	21.41
price	1.75	42.86	47.88	52.91
K/Kg	2.50	74.36	79.38	84.41

Assumptions:

- 1 Ewes and rams purchased from DPI.
- 2 100% lambing.
- 3 90% weaning.
- 4 Replacement 20% (ie: 10% culls, 10% deaths).
- 5 SALES:

Fat wethers (males) sold for ceremonial/exchange use @ K70/head .
No butcher sales occur since live prices so high.
Cull ewe price reflects wether price.

In the budget the surplus ewe hogget price used is the opportunity cost of purchases from DPI. It is unlikely that sales of ewe hoggets would occur at this price. The budget reflects status quo or constant numbers; in reality the farmer would probably retain the best ewe hoggets to increase breeding flock numbers. Butchery sales values are about K1.25/Kg carcass weight. Based on a carcass of 25 Kg, fat wether (2-4 tooth), the butchery value is only $25 \times K1.25 = K31.25$

6 WOOL PRICE AND WEIGHTS:

Wool is sold to DPI for 1 Kina per kilogram and is sent to the UK. There appears to be potential in setting up a craft wool market locally to utilise the small current volumes of wool available. Long term prices are likely to rise to market prices of around K2.00 to K2.50 per kilo. for greasy wool. Achieved wool weights are low at only 2.5 Kg/head; there is potential to double this production to over 4.5 Kg/head.

7 Pasture establishment - existing feed or use splits and runners.

Stocking rate:	Natural grazing	5 /hectare
	Semi-improved	7 /hectare
	Improved	10 to 16 /hectare

8 Grazing systems:

or

night shelter and herding
paddock set-stocking (one paddock)

3.6 SHEEP GROSS MARGIN

SMALLHOLDER BREEDING AND FATTENING AT STEADY
STATE. LOWLAND VILLAGE SMALLHOLDER.

ASSUMPTIONS:-

1. BREEDING OWN REPLACEMENT (PRIANAN)
2. LAMBING % 90 %
3. MORTALITY
 - LAMBS 5 %
 - ADULTS 5 %
4. PASTURES : NATURAL AND NO IMPROVEMENT.
5. SALES
 - ALL SALES AT FARMGATE PRICE.
 - FAT WETHERS SOLD @ K50.00/HEAD.
 - CULL EWE SOLD @ K50.00/HEAD.
 - CULL RAM SOLD @ K30.00/HEAD.
6. REPLACEMENT RATE
 - EWE REPLACEMENT 20 %
 - RAM REPLACEMENT AFTER 3 YEARS
7. STOCKING RATE
 - NATURAL PASTURES 10 HEAD/HA
8. GRAZING SYSTEMS
 - DAYTIME GRAZING/NIGHT CONFINEMENT IN SHELTER,
 - COMBINED WITH NET STOCKING IN 1 HA PADDOCK.
9. NO WOOL IS SOLD.

LIVESTOCK TRADING ACCOUNT

	OPENING NUMBERS	S.S.U	T.S.S.U	CLOSING KINA PER NUMBERS HEAD	TOTAL KINA
1. EWES	10	1.0	10.0	10	400
2. EWE HOGGETS	4	0.7	2.8	4	160
3. WETHER HOGGETS	5	0.8	4.0	5	150
4. RAMS	1	0.8	0.8	1	35
	20		17.6	20	K745

PURCHASES

SALES

	NUMBERS	K/HEAD	TOTAL	NUMBERS	K/HEAD	TOTAL
1. EWES	0			2	50	100
2. EWE HOGGET	0			2	50	100
3. WETHER HOGGET	0			4	50	200
4. RAM REPLACEMENT EVERY 3 YEAR.	0.33	50	17	0.33	30	10
	0.33		17.6	8.33		K410

BIRTHS

DEATHS

LAMBING 90 %	9	1
TOTAL	29.33	29.33

INCOME:-

	KINA	PER S.U.
GROSS INCOME FROM SHEEP SALES	410.00	23.30
LESS: SHARE OF RAM PURCHASE	16.67	0.95
WOOL SALES	NIL	
NET INCOME	K393.33	(A) K22.35

<u>VARIABLE COSTS</u>	<u>KINA</u>	<u>PER S.U.</u>
1. FEED SUPPLEMENT	0.00	0.00
2. DRENCH		
NILVERM APPLIED 6 MONTHLY BASIS		
ADULTS : 10 MLS/HEAD @ K0.05/ML	11.00	0.63
HOGGETS : 7.5 MLS/HEAD @ K0.05/ML	6.75	0.38
LAMBS : 5 MLS/HEAD @ K0.05/ML	4.50	0.26
3. SCREW WORM SMEAR : 1 KG/YR @ K10.00/KG	10.00	0.57
4. SALT LICK		
3 BLOCKS/YEAR @ K10.00/BLOCK	30.00	1.70
5. SUNDRIES	10.00	0.57
TOTAL VARIABLE COSTS	<u>K72.25</u>	(B) <u>K4.11</u>
TOTAL GROSS MARGIN	<u>K321.08</u>	(A - B) <u>K18.24</u>
GROSS MARGIN/S.S.U		
RETURN/MANDAY : 63 MANDAY/YEAR	K5.10	

SENSITIVITY ANALYSIS:-

GROSS MARGIN PER STOCK UNIT		LAMBING %		
		80.0%	90.0%	100.0%
PRICE:	K40.00	12.07	13.58	15.10
KINA	K50.00	16.35	K18.24	20.14
PER HEAD	K60.00	20.63	22.90	25.18

SOURCE : D.A.L, LABU RESEARCH CENTRE, LAE.

3.7 SEMI-COMMERCIAL SHEEP BUDGET

Breed: Highland half-bred

TRADING ACCOUNT:

	Opening numbers	SSU	Closing numbers	CAPITAL VALUES	
				K/head	Total (k)
Ewes	50	50	50	40.00	2,000.00
Ewe hoggets	10	7	10	40.00	400.00
Wether hoggets	25	20	25	30.00	750.00
Rams	2	1.6	2	35.00	70.00
	87	78.6	87		K3,220.00
	<u>Purchases</u>		<u>Sales</u>	<u>K/head</u>	<u>Total (k)</u>
Cull ewes	0		10	70.00	700.00
Ewe hoggs's	0		10	60.00	600.00
Wethers	0		25	70.00	1,750.00
	0		45		K3,050.00 (A)

	Births	Deaths
Lambing	100.0%	
	50	5
	50	5
TOTALS:	137	137

	Number	Kg/head	Total Kg	Kina/Kg	Total (K)
Ewes	50	2.5	125.0	0.50	62.50
Ewe hoggets	10	2.0	20.0	0.50	10.00
Wethers	25	2.0	50.0	0.50	25.00
Rams	2	3.0	6.0	0.50	3.00
OTHER INCOME:			201.00		K100.50 (B)
Manure sales					K200.00 (C)
			TOTAL INCOME		K3,350.50 (A+B+C)

Variable costs:

		Cost/unit	Total (K)
Feed		nil	
Drench-	Nilverm drench		
	Adults 10ml/head	monthly	K44.30/l
	Hoggets 7.5ml/head	monthly	368.58
	Lambs 5ml/head	monthly	37.20
Salt blocks-			35.44
	1 for 6 head, 6 monthly = 30 blocks/yr @	K12.60/blk	378.00
	Total variable costs		K819.22 (D)
	Total gross margin		K2,531.28 (A+B+C-D)
	G.M. per sheep stock unit (SSU).....	K32.20	

FIXED COSTS:

Repairs and maintenance		80.00
Labour-	One full-time youth at junior rural rates, K18 per fortnight	468.00
	Fixed costs	K548.00 (E)
	Total variable and fixed cost	K1,367.22 (D+E)
	PROFIT (before interest and depr.)	K1,938.28 (A+B+C-D-E)
	Profit net of depreciation	K1,786

RETURN ON LIVESTOCK CAPITAL: (after deducting fixed costs)	61.6%
RETURN PER MAN DAY	Man days 365 G.M. per man day K6.94
G.M. NET OF INTEREST ON L/STOCK CAPITAL: at 8 percent	K2,273.68
	K28.93
RETURN ON TOTAL CAPITAL: (depreciation deducted)	37.6%
	Total per SSU

SENSITIVITY ANALYSIS:

GROSS MARGIN PER SSU:		Lambing %		
		80%	100%	120%
Wool	2.50	26.22	32.20	38.18
weight	3.00	27.76	33.74	39.72
Kg/ssu	3.50	28.02	33.99	39.97

GROSS MARGIN PER SSU:		Lamb price (K per head)				
		30.00	40.00	50.00	60.00	70.00
Wool	0.50	10.03	15.57	21.12	26.66	32.20
price	1.00	11.31	16.85	22.40	27.94	33.48
K/Kg	1.75	13.23	18.77	24.31	29.86	35.40
	2.50	15.15	20.69	26.23	31.78	37.32

<u>Capital equipment required:</u>		each		Annual
		<u>Kina</u>	<u>Total</u>	<u>depreciation</u>
Shearing blades per pair		23.45	46.90	15.63
Drenching gun		67.00	67.00	22.33
Labour & materials for night housing		265.00	265.00	53.00 (ref Agbank)
Fencing costs:	Pig Wire	12 rolls	40.95	491.40
(1 ha fenced	HT wire	3 rolls	79.17	9.50
600m boundary)	Posts-hardwood 200	1.00	200.00	25.00
	Gate	1	70.00	7.00
Miscellaneous items			150.00	30.00
			K1,527.81	K197.46

Assumptions:

- 1 Ewes and rams purchased from DPI.
- 2 100% lambing. Range 100 - 120 %
- 3 90% weaning.
- 4 Replacement 20% (culls and deaths).
- 5 SALES:
 - Fat wethers (males) sold for ceremonial/exchange use @ K70/head .
 - Range K60 - K100/head.
 - No butcher sales occur since live prices so high.
 - Cull ewe price reflects wether price.
 - The budget shows similar opening and closing numbers; in reality the farmer would probably retain the best ewe hoggets to increase breeding flock numbers.
 - Butchery sales values are about K1.25/Kg carcass weight. Based on a carcass of 25 Kg, fat wether (2-4 tooth), the butchery value is only 25 * K1.25 = K31.25
- 6 WOOL PRICE AND WEIGHTS:
 - Wool is sold to DPI for 50 toea per kilogram and is sent to the UK. There appears to be potential in setting up a craft wool market locally to utilise the small current volumes of wool available.
 - Long term prices are likely to rise to market prices of around K2.00 to K2.50 per kilo. for greasy wool.
 - Achieved wool weights are low at only 2.5 Kg/head.
- 7 Pasture establishment - existing feed or use splits and runners.
 - Stocking rate:
 - Natural grazing 5 /hectare
 - Semi-improved 7 /hectare
 - Improved 10 to 16 /hectare
- 8 Grazing systems:
 - night shelter and herding
 - plus One holding paddock of 1 hectare.
 - Night housing 1 sq.metre per head required.

SOURCE : D.A.L., GOROKA.

Assumptions:

- Source of Layer birds
 Ilimo Farm Products Pty Ltd, Zenag
 Arrangements to be at least a month in advance.
- Size of the flock
 600 bird layer unit
- Housing of Poultry
 60' x 20' rearing to 5 1/2 months
 75' x 20' corrugated, galv. iron roof for laying - 22 to 72 weeks.
 30' x 15' galv. iron roof moisture proof for feed storage
- Supply of feed
 All feed required for the project will be bought from Lae Feed Mill.
- Feeding programme for layer chickens
 From 0-6 weeks: pullet starter
 From 6-22 weeks: pullet developer
 From 22-72 weeks: lay pellets/crumbles
- Feed costs at Lae
 Pullet starter Crumbles-K369/tonne
 Pullet developer pellets-K318/tonne
 Layer pellets/crumbles-K322/tonne
- Feed cartage; mill to project
 K12.00/tonne
- Day old pullet cost
 K100/100 birds
- Day old pullets cartage; airport to project
 K1.67/100 pullets

- Sawdust/wood shavings cartage
K15/load
- Shed Construction
Family labour/exchanged labour/hired labour
- Building materials
Bush Materials
Corrugated/galv. iron roof
Chicken wire netting 1/2" mesh
Nails/stapples
Plasson drinkers
Self-feeders
50 gallon tank on stand plus pipe fittings
2000 gallon tank complete
Cement for concrete slab
Polythene hose - 18 mm
Egg baskets
- Brooding requirements
Lattern lamps
Hessian sheet/feed bags
Kerosene
Flat iron - 3 sheets for surroundings.
Deep litter flooring
- Stocking rate
On deep litter: - 2.5 square feet per bird
Feed space: 10 cm/bird
In cages: - 450³ cm/bird
Feed space: 10 cm/bird
drink access 2 cm/bird
- Feed consumption per bird
From 0-6 weeks of age: 1 kg
From 6-22 weeks of age: 7.5 kg
From 22-72 weeks of age: 43.5 kg. i.e 1 year layer life.
30 weeks of age: 0.87 kg/week
- Feed consumption per 600 birds
From 0-6 weeks: 600 kg (12/50 kg bags)
From 6-22 weeks: 4,500 kg (90/50 kg bags)

From 22-72 weeks: 26,100 kg (522/50 kg bags)

- Drinking water

One bird drinks 340 mls of water per day from about five weeks of age and onwards.

- Drinking trough space

All 6 cm per bird lineal centimetre on both sides of the trough.

- Feeding trough space

Allow 40 birds per standard bucket feeder

Allow 10 cm space per bird lineal centimetre on both sides of the trough

- Pullets start laying at 5 to 5 1/2 months of age

Layer birds will require 45 cm x 45 cm of floor space on deep litter flooring - sufficient roosts, egg nests and clean water required.

- Egg production per hen in her economic life (6-18 months of age).

160-240 eggs

- Sales

Eggs will be sold every 2-3 days

Culled (spent) hens be sold live

- Mortality rate

From 0-5 months of age - 11%

From 5-18 months of age - 16%

- Timing of replacement stock

All laying hens to be sold/disposed at 18 months of age.

The laying hens will have been laying for 12 months - any longer than 8 months will lead to high feed consumption - low return.

It will take 5-5 1/2 months to raise pullets before they start to lay eggs: ie. replacement stock must be bought as day old chicks when the laying stock is 12 months old.

- Feed ordering programme

Since feed quality deteriorates when kept longer than 3 months - it is recommended that fresh stock of feed should be bought every 3 months.

- Feed ordering programme in this sample budget

Year 1 : 1st and 2nd quarter

0 - 6 wks : starter ration 1 kg X 600 birds = 600 kg

6 - 22 wks: developer 7.5 kg X 600 birds = 4,500 kg

22 - 26 wks : layer ration 0.87 kg/wk X 4 x 600 = 2,088 kg

Total = 7.2 tonnes

3rd and 4th quarters

layer rations

13 x 2 = 26 wks x 0.87 kg x 600 birds = 13.572 tonnes

Year 2

Layer rations

52 wks x 0.87 kg x 600 birds = 27.15 tonnes

Rearing new batch layers

0 - 6 wks starter 600 kg

6 - 22 wks developer 4,500 kg

Total: 5.1 tonnes

Sample Budget:

- BUILDING COST (CAPITAL EXPENDITURE) FOR 3 SHEDS:
REARING/LAYING/FEED STORE

	KINA
Rearing shed complete	800
Laying shed complete	5,500
Feed Store complete	660
Plasson drinkers - 10 units	170
Self-feeders - 30 units	390
Polythene hose - 18mm, 16mm	96
50 gal. tank on stand plus pipe fittings	500
2000 gal. tank complete - 1 unit	650
Cement - 24 bags	202
Gravel - 3 loads	60
Wire Nettings	80
Egg baskets - 3 units	50
Hessian sheeting - 1 roll	70
Flat Iron - 3 sheets	50
Labour (Value)	<u>1,500</u>
TOTAL (CAPITAL EXPENDITURE)	10,778

• VARIABLE/OPERATIONAL COST	YEAR 1 KINA	YEAR 2 KINA
Feed consumption per 600 birds		
From 0-6 weeks (12 bags P.S)	222	222
From 6-22 weeks (90 bags P.D)	1,440	1,440
From 22-52 weeks (313 bags L.P)	5,042	8,740
Day old pullets	600	600
Medication (deworming & anti-biotics)	50	70
Cartage of saw dust	30	30
Cartage of feed @ K12/tonne	249	387
Year 1 : 20.75 tonnes		
Year 2 : 32.25 tonnes		
Chickens	10	10
Brooding kerosene		
10 litre x 7 nights	10	10
Egg trays - assume 200 eggs/bird/year	854	1,480
Marketing and delivery	250	400
Repairs and Maintenance	500	500
Labour (family/exchange)	2,106	2,106
TOTAL	11,363	15,995

Return per Batch

1.	Average number of birds in lay *	508	492
	Productive months	7 mths	12 mths
	Eggs per bird **	140	200
	Total production (eggs)	71,120	98,400
	@ 94 % sale (eggs)	66,852	92,496
	@ K2.80/dozen (ungraded)	15,598	21,583
2.	Cull birds		
	end lay (year 2) 438 @ K4.00	nil	1,752
	Gross income	15,598	23,335
	less variable costs	11,363	15,995
	Gross margin	4,235	7,340
	Gross margin per bird	8.34	14.92

* Based on the mortality assumption 534 pullets will reach initial point of lay and 438 hens will be sold as culls at the end of lay.

** Based on production over 12 months lay period of 200 eggs/bird.

SOURCE : Animal Husbandry Centre, D.A.I., LABU.

The budget is prepared based on the experience of Poultry Development Officers.

- Based on 200 broiler birds:-
- Such size is optimum for a family unit
- Small scale broiler units are confined to peri-urban areas due to easy road, transport and market access - where buyers would have regular income through employment and business enterpreneurship.
- Broiler require special feed in precise amounts and regular supply.
- Birds are sold at live market at K5.50 per bird at 7 weeks of age onwards.
- Range of sale price at K5.00 per bird to K6.00 at 10 weeks.
- Niugini Table Birds (NGTB) to supply day old chickens - K100/100 broiler birds at local sale.
- Housing built with bush materials at 9'x 25' (225 sq.ft) or 2.7m x 7.6m (20.52m²) with space allowance for feed and water troughs. Litter, floor: either coffee hulls, saw-dust or wood shavings.
- Another shed, moisture and rodent proof is necessary for feed store.
- Chicken feed supply at retail agents - at Farmset/Harcross Feed Cost at K23.00 per 50 kg bag - Broiler Starter; K21.00 per 50 kg bag - Broiler Finisher.
- Feed programme from 0-3 weeks, broiler starter; from 3-10 weeks, broiler finisher.
- Building Materials:
 - Bush Material
 - Chicken wire netting (1/2" or 13 mm mesh)
 - Nails/Stapples
 - Bamboo water troughs
 - Feed troughs - self feeders

- Brooding requirements:
 - Flat iron - 1 sheet for surrounds
 - Hessian/Feed Bags
 - Hurricane lamp
 - Deep litter flooring
- Family labour, (no cost included) construction of broiler and feed sheds

Assumptions:

- Stocking rate, 1 sq.ft per bird or 13 birds per m².
- Feed Consumption:
 - 0-7 days old - 106 g/bird
 - Up to 21 days old - 750 g/bird
 - Up to 35 days old - 2,000 g/bird
 - Up to 45 days old - 3,400 g/bird
 - Up to 56 days old - 4,300 g/bird
 - From 56 days old and onward - 129 g/bird

Based on the above a bird would consume 2.0 kg of feed at 5 weeks of age, 3.4 kg at 6 1/2 weeks of age, 4.3 kg at 8 weeks and 6.0 kg at 10 weeks of age.

- Water Consumption:
 - 0-7 days old - 22.0 mls/bird/day
 - 8 to 21 days old - 53.0 mls/bird/day
 - 22 to 35 days old - 124.0 mls/bird/day
 - 36 to 49 days old - 223.0 mls/bird/day
 - 50 to 63 days old - 307.0 mls/bird/day
- Drinking trough space:
 - 6 cm lineal per bird on both sides of the trough
- Feeding trough space:
 - 40 birds per standard self-feeder
- Mortality:
 - 0-10 wks - 10%
- Birds expected to reach marketable size as of 7 weeks onwards.

Sample Budget: (10 week period from purchasing day old chicks to sale)

A. PHYSICAL OUTPUT:

The project expects to lose 10% of total 200 birds. This means 180 fat chickens will be available for sale at the end of 10 weeks growing period. All birds must be sold then.

B. GROSS REVENUE: KINA

180 broiler birds @ K5.50 per bird 990.00

C. VARIABLE COSTS:

- Feed consumption per 200 birds
 - 0-3 weeks - 3 bags Broiler Starter @ K23.00 per bag 69.00
 - 3-10 weeks - 21 bags Broiler Starter @ K21.00 per bag 441.00
- Cartage of feed by PMV K0.40 per bags @ 24 bags 9.60
- Cartage of sawdust/wood shavings 2 loads @ K15.00/load 30.00
- Cartage of day old chicks by PMV @ K2.00 2.00
- Day old broilers 200 birds @ K1.00 per bird 200.00
- Brooding 1.00
- Marketing Expenses 30.00
- Maintenance and Repairs 73.00

TOTAL VARIABLE COST K855.60

Gross Margin per 180 birds:-
per batch K134.40
Gross Margin per bird K0.67

Capital Cost (Building)

- One broiler shed - 25'x9' and a feed store shed built of bush material.
- Chicken wire netting (1/2" mesh)
 - 2 rolls 150.00
- Nails and Stapples 23.00
- Self-feeders - 5 @ K36.00 per feeder 180.00
- Hurrican Lamp 12.00
- Sheet of flat iron @ K16.00 16.00

TOTAL CAPITAL COSTS K381.00

SOURCE: Animal Husbandry Centre, DAL, Labu.

3.9 (Cont) Broiler Gross margins: 200 bird unit.

SENSITIVITY ANALYSIS:-

TOTAL GROSS MARGIN AT VARIOUS MORTALITY RATES AND SELLING PRICES (200 BIRD UNIT OVER 10 WEEKS)

MORTALITY RATES:

		4%	6%	8%	10%
PRICE,	5.00	104.00	84.00	64.00	44.00
KINA	5.50	200.00	178.00	156.00	134.00
PER	6.00	296.00	272.00	248.00	224.00
BIRD	6.50	392.00	366.00	340.00	314.00
	7.00	488.00	460.00	432.00	404.00

GROSS MARGIN PER BIRD AT VARIOUS MORTALITY RATES AND SELLING PRICES (200 BIRD UNIT OVER 10 WEEKS)

MORTALITY RATES:

		4%	6%	8%	10%
PRICE,	5.00	0.52	0.42	0.32	0.22
KINA	5.50	1.00	0.89	0.78	0.67
PER	6.00	1.48	1.36	1.24	1.12
BIRD	6.50	1.96	1.83	1.70	1.57
	7.00	2.44	2.30	2.16	2.02

TOTAL GROSS MARGIN AT VARIOUS FEED COSTS AND SELLING PRICES AT CONSTANT MORTALITY RATE OF 10 %.(200 BIRD UNIT OVER 10 WEEKS).

FEED COSTS:

		-20%	-10%	MODEL	+10%	+20%
PRICE,	5.00	146.00	94.00	44.00	6.00	58.00
KINA	5.50	236.00	184.00	134.00	84.00	32.00
PER	6.00	326.00	274.00	224.00	174.00	122.00
BIRD	6.50	416.00	364.00	314.00	264.00	212.00
	7.00	506.00	454.00	404.00	354.00	302.00

GROSS MARGIN PER BIRD AT VARIOUS FEED COSTS AND SELLING PRICES AT CONSTANT MORTALITY RATE OF 10 %.(200 BIRD UNIT OVER 10 WEEKS).

FEED COSTS:

		-20%	-10%	MODEL	+10%	+20%
PRICE,	5.00	0.73	0.47	0.22	0.03	0.29
KINA	5.50	1.18	0.92	0.67	0.42	0.16
PER	6.00	1.63	1.37	1.12	0.87	0.61
BIRD	6.50	2.08	1.82	1.57	1.32	1.06
	7.00	2.53	2.27	2.02	1.77	1.51

3.10 200 BIRDS BROILER BUDGET - GOROKO BASED.

BASIC ASSUMPTIONS

1. DAY OLD BROILER SUPPLY.
K150/100 BROILERS AT FARMSET LTD, GOROKO.
2. FEED COSTS
 - BROILER STARTER (BS) - K23.00/BAG
 - BROILER FINISHER (BF) - K23.00/BAG
3. MORTALITY 0-13 WEEKS AT 12 %.
4. FEED INTAKE IN 49 DAYS.
 - 0-3 WEEKS 1.5 KG/BIRD.
 - 3-7 WEEKS 4.5 KG/BIRD.
5. 4 BATCHES IN A YEAR.
6. PRICE - OVER 6 WEEKS : K9.00/BIRD.
7. BROODING REQUIREMENTS
 - FIREWOOD, 200 LITRE DRUM (FIRE PLACE.)
8. 176 FAT CHICKENS WILL BE AVAILABLE AFTER 13 WEEKS GROWING PERIOD.

INCOME

KINA

176 BIRDS X K9.00/BIRD	1,584.00
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CAPITAL COSTS

HOUSING	
CHICKEN WIRE NETTING (1/2" MESH) - 2 ROLLS	180.00
NAILS AND STAPLES	25.00
SELF FEEDERS (5 UNITS)	200.00
HURRICAN LAMP AND 200 LITRE DRUM	16.00
1 SHEET FLAT IRON (SURROUNDINGS)	18.00
 SUB-TOTAL	 <u>439.00</u>

VARIABLE COSTS

FEED CONSUMPTION/200 BIRDS	
0-3 WEEKS (3 BAGS BS @ K23/BAG)	69.00
3-13 WEEKS (33 BAGS BF @ K23/BAG)	759.00
CARTAGE OF FEED ON PMV	15.00
CARTAGE OF WOOD SHAVINGS (2 LOADS)	40.00
CARTAGE OF DAY OLD BIRDS ON PMV	3.00
DAY OLD BIRDS	300.00
BROODING - KEROSINE/FIREWOOD	6.00
MARKET EXPENSE	40.00
MAINTENANCE & REPAIRS	88.00
 TOTAL VARIABLE COSTS	 <u>1,320.00</u>
GROSS MARGIN	<u>264.00</u>
GROSS MARGIN PER BIRD	1.50

SENSITIVITY ANALYSIS

GROSS MARGIN PER BIRD AT VARIOUS FEED COSTS AT 12 %
MORTALITY RATE (200 BIRDS UNIT OVER 13 WEEKS).

FEED COSTS

		-20 %	-10 %	MODEL	+10 %	+20 %
PRICE, KINA PER BIRD	8.00	1.27	0.85	0.44	0.03	(0.39)
	8.50	1.71	1.29	0.88	0.47	0.05
	9.00	2.15	1.73	1.32	0.91	0.49
	9.50	2.59	2.17	1.76	1.35	0.93

TOTAL GROSS MARGIN AT VARIOUS FEED COSTS AT 12 %
MORTALITY RATE (200 BIRD UNITS OVER 13 WEEKS).

FEED COSTS

		-20 %	-10 %	MODEL	+10 %	+20 %
PRICE, KINA PER BIRD	8.00	253.60	170.80	88.00	5.20	(77.60)
	8.50	341.60	258.80	176.00	93.20	10.40
	9.00	429.60	346.80	264.00	181.20	98.40
	9.50	517.60	434.80	352.00	269.20	186.40

TOTAL GROSS MARGIN AT VARIOUS MORTALITY RATES
AND SELLING PRICES (200 BIRD UNITS OVER 13 WEEKS).

MORTALITY RATES

		8 %	10 %	MODEL	14 %	16 %
PRICE, KINA PER BIRD	8.00	152.00	120.00	88.00	56.00	24.00
	8.50	244.00	210.00	176.00	142.00	108.00
	9.00	336.00	300.00	264.00	228.00	192.00
	9.50	428.00	390.00	352.00	314.00	276.00

GROSS MARGIN PER BIRD AT VARIOUS MORTALITY RATES
AND SELLING PRICES (200 BIRD UNITS OVER 13 WEEKS).

MORTALITY RATES

		8 %	10 %	MODEL	14 %	16 %
PRICE, KINA PER BIRD	8.00	0.76	0.60	0.44	0.28	0.12
	8.50	1.22	1.05	0.88	0.71	0.54
	9.00	1.68	1.50	1.32	1.14	0.96
	9.50	2.14	1.95	1.76	1.57	1.38

3.11 100 BIRDS BROILER BUDGET - RABAUL BASED.

BASIC ASSUMPTIONS

1. DAY OLD BROILER SUPPLY.
K138/100 BROILERS LANDED PRICE AT AGRICULTURAL
SUPPLIES AND EQUIPMENT, RABAUL.
2. FEED COSTS
 - BROILER STARTER (BS) - K20.80/BAG
 - BROILER FINISHER (BF) - K21.00/BAG
3. MORTALITY 0-9 WEEKS AT 5-10 %.
4. FEED INTAKE IN 49 DAYS.
 - 0-3 WEEKS 1.5 KG/BIRD.
 - 3-7 WEEKS 4.5 KG/BIRD.
 - AFTER WEEK 7 ASSUME 0.161 KG/DAY/BIRD
5. LABOUR - 80 MANDAYS AT K2.59/MAN/DAY
6. 4 BATCHES IN A YEAR.
7. PRICE - OVER 6 WEEKS PERIOD (WEEK 7 TO WEEK 13): K8.00/BIRD.
8. 93 BIRDS AVAILABLE FOR SALE AT 7 WEEKS. (7 % MORTALITY)

<u>INCOME</u>	<u>KINA</u>
93 BIRDS X K8.00	744.00

CAPITAL COSTS

HOUSING	
BUSH MATERIAL (ROOF THATCH)	20.00
1 SHEET FLAT IRON (SURROUNDING)	16.00
NAILS	25.00
SELF FEEDERS (3 UNITS)	90.00
HURRICAN LAMP AND KEROSENE	10.00
 SUB-TOTAL	 <u>161.00</u>

VARIABLE COSTS

FEEDS	368.00
DAY OLD BIRDS	138.00
BROODING MATERIALS	6.00
MARKET EXPENSES	10.00
TRANSPORT - WOODSHAVING	3.00
FEED (18 - 19 BAGS)	12.00
 SUB-TOTAL	 <u>537.00</u>
GROSS MARGIN PER BATCH	<u>207.00</u>
GROSS MARGIN PER BIRD	2.07

SENSITIVITY ANALYSIS

**GROSS MARGIN PER BIRD AT VARIOUS FEED COSTS AND
SALE PRICES FOR BIRDS AT 7 % MORTALITY RATE.
(100 BIRDS UNIT OVER 6 WEEKS)**

	-20 %	-10 %	MODEL	+10 %	+20 %	
PRICE, KINA PER BIRD	7.00	1.88	1.51	1.14	0.77	0.40
	7.50	2.34	1.97	1.61	1.24	0.87
	8.00	2.81	2.44	2.07	1.70	1.33
	8.50	3.27	2.90	2.54	2.17	1.80
	9.00	3.74	3.37	3.00	2.63	2.26

**TOTAL GROSS MARGIN AT VARIOUS FEED COSTS AND
SALE PRICES FOR BIRDS AT 7 % MORTALITY RATE.
(100 BIRDS UNIT OVER 6 WEEKS)**

		-20 %	-10 %	MODEL	+10 %	+20 %
PRICE, KINA PER BIRD	7.00	187.60	150.80	114.00	77.20	40.40
	7.50	234.10	197.30	160.50	123.70	86.90
	8.00	280.60	243.80	207.00	170.20	133.40
	8.50	327.10	290.30	253.50	216.70	179.90
	9.00	373.60	336.80	300.00	263.20	226.40

**GROSS MARGIN PER BIRD AT VARIOUS MORTALITY RATES
AND SALE PRICES (100 BIRDS UNIT OVER 6 WEEKS)**

MORTALITY RATES

	3 %	5 %	MODEL	9 %	11 %	
PRICE, KINA PER BIRD	7.00	1.42	1.28	1.14	1.00	0.86
	7.50	1.91	1.76	1.61	1.46	1.31
	8.00	2.39	2.23	2.07	1.91	1.75
	8.50	2.88	2.71	2.54	2.37	2.20
	9.00	3.36	3.18	3.00	2.82	2.64

**TOTAL GROSS MARGIN AT VARIOUS MORTALITY RATES
AND SALE PRICES (100 BIRDS UNIT OVER 6 WEEKS)**

MORTALITY RATES

	3 %	5 %	MODEL	9 %	11 %	
PRICE, KINA PER BIRD	7.00	142.00	128.00	114.00	100.00	86.00
	7.50	190.50	175.50	160.50	145.50	130.50
	8.00	239.00	223.00	207.00	191.00	175.00
	8.50	287.50	270.50	253.50	236.50	219.50
	9.00	336.00	318.00	300.00	282.00	264.00

3.12 MODEL BUDGET FOR A COMMERCIAL SMALLHOLDER 10 SOW

PIGGERY UNIT. BREEDING AND FATTENING

ASSUMPTIONS

1. STOCK NUMBERS

10 SOW BREEDERS

1 BOAR

20 % REPLACEMENT OF BREEDING STOCK/YR

REPLACE BOAR IN EVERY 3 1/2 YEARS

2. PRODUCTION

2 LITTERS PER SOW YEAR

AVERAGE LITTER SIZE AT BIRTH - 10 PIGLETS

20 % MORTALITY FROM BIRTH TO WEANING

WEANING AFTER 30 DAYS

AVERAGE LITTER SIZE AT WEANING - 8 PIGLETS/SOW

16 PIGLETS SOW/YEAR

BREEDING INTERVAL (MATING-FECONDATION-LACTATION) - 170 DAYS

DAILY WEIGHT GAIN - 550 GRAMS

FEED CONVERSION RATIO - 3.0

DRESSING % = 75

3. FEEDING REGIMES

TYPES OF FEEDS : PIG STARTER (PS) - 20 - 22 % CP

PIG GROWER (PG) - 16 % CP

PIG BREEDER (PB) - 14 % CP

CLASS OF PIG	AGE OR KGS	TYPES OF FEED	DAILY REQUIREMENT (KG FEED/PIG/DAY)
PIGLETS	10-30 DAYS	PIG STARTER	0.25-0.50 KG
WEANERS	10-20 KG	PIG GROWER	0.50-1.0 KG
GROWER	20-40 KG	PIG GROWER	1.5-2.0 KG
PORKER	40-60 KG	PIG GROWER	2.0-2.5 KG
BACONER	70-90 KG	PIG GROWER	2.5-3.0 KG
DRY SOW	100-110 KG	PIG BREEDER	2.0-2.5 KG
SOW IN PIG	120-200 KG	PIG BREEDER	2.0-2.5 KG
LACTATING SOW	120-200 KG	PIG BREEDER	3.5-4.0 KG
BOAR	120-200 KG	PIG GROWER	1.5-2.0 KG

WATER INTAKE - BREEDING SOW 5.5 LITRES PER SOW PER DAY.

- GROWING PIG 1.6 LITRES PER PIG PER DAY

4. FEED PRICE PER TONNE

	PRICE PER TONNE	PRICE PER KG
PIG STARTER	K369.00	K0.37
PIG GROWER	K306.00	K0.31
PIG BREEDER	K290.00	K0.29

5. FEED SOURCE

LAE FEED MILLS PTY LTD. PRICE PER TONNE QUOTED FOR TWO TONNES AND OVER.

6. LABOUR REQUIREMENTS

FEEDING - 30 MINS/DAY

WASHING/CLEANING FLOOR - 60 MINS/DAY

FARROWING 4 HRS/SOW/YR

POST NATAL TREATMENT - 2 HRS/SOW/YR

(INJECTIONS, TOOTH CUTTING, CASTRATION ETC.)

7. TRANSPORT REQUIREMENTS

PIG CARTAGE - K10.00/TRIP

FEED CARTAGE - K10.50/TONNE

8. VET AND MED

IRON MIX 2 MLS/PIGLET

NEFTIN SUSPENSION 2 MLS/PIGLET

PIG WORMER - 4 GRAMS/PIG

TERRAMYCINE INJECTION : 20 MLS/SOW

CO-CAL PIG SPRAY : 10 MLS/PIG

9. HOUSING

SPACE REQUIREMENT AND PEN LAYOUT.

PIG WEIGHT (KG)	AREA PER PIG (SQUARE METRE)	
	SOLID FLOOR	SLATTED FLOOR
4-11	0.37	0.25
11-18	0.56	0.28
18-45	0.74	0.37
45-68	0.93	0.55
68-95	1.11	0.74

FARROWING PEN : 0.56 M WIDTH X 1.67 M HEIGHT X 2.13 M LONG

FEED TROUGH SPACE

WEIGHT (KG)	TROUGH SPACE PER PIG
	(MM)
11-18	150
18-45	250
45-68	290
68-95	330
SOWS	350

FOR GROUP FEEDING, ONE FEED SPACE SHOULD
BE ALLOWED EVERY 3-4 PIGS WITH PENS OF OVER 20 PIGS.

10. BREEDING POLICY

BREED AND SELECT REPLACEMENT BREEDING STOCK FROM THE HERD
REPLACE 2 SOWS WITH GILTS EVERY YEAR.

BUY IN REPLACEMENT BOAR 6-8 MONTHS BEFORE CULLING AFTER 3 1/2 YEARS.

11. SALES

10 SOWS X 16 PIGS PER YEAR = 160 PIGS

80 PIGS SOLD AS PORKERS AT 60 KG LIVEWEIGHT

78 PIGS SOLD AS BACONERS AT 70-90 KG (2 GUILTS RETAINED AS REPLACEMENTS)

CULLED SOWS SOLD AT SINGSING MARKET AT K500.00/PIG

ALL CARCASS SOLD AS PORKERS AND BACONERS THROUGH BUTCHERIES AT A DRESSING PERCENTAGE OF 75 % AT K2.70/KG AND K2.51/KG RESPECTIVELY.

INCOME:-

KINA

PORKERS

60 KG X 0.75 X 80 PIGS X K2.70/KG PER PIG

9,720

BACONERS

80 KG X 0.75 X 78 PIGS X K2.51/KG

11,747

CULLED SOWS

2 X K500.00

1,000

TOTAL

K22,467

VARIABLE COSTS:-

FEED

PIGLETS : 160 @ 30 DAYS X 0.50 KG @ 37 TOEA/KG

888

GROWERS : 160 X 109 DAYS X 2.0 KG @ 31 TOEA/KG

10,813

BACONERS: 78 X 55 DAYS X 2.5 KG @ 31 TOEA/KG

3,325

DRY SOW : 10 X 26 DAYS X 2.0 KG X 29 TOEA/KG

151

SOW IN PIG : 10 X 114 DAYS X 2.5 KG X 29 TOEA/KG

827

LACTATING SOW : 10 X 30 DAYS X 3.5 KG X 29 TOEA/KG

305

BOAR : 1 X 365 DAYS X 2.0 KG X 31 TOEA/KG

226

SUB TOTAL

K16,534

LABOUR

FEEDING : 30 MINS/DAY X 365 X K0.60/MAN HOUR

110

WASHING AND CLEANING : 1 HOUR/DAY @ K0.60 X 365 DAYS

219

FARROWING : 4 HOURS/SOW/YEAR

24

POST - NATAL VET AND MED TREATMENTS PER

SOW AND LITTERS

MANHOUR SOW & LITTER : 2 HOURS/SOW/YEAR

12

SUB TOTAL

K365

TRANSPORT

CARTAGE OF FEED : K10.50/TONNE X 53.15 TONNES

558

PIG CARTAGE TO ABATTOIR : K10.00 X 2 TRIPS

20

SUB TOTAL

K578

VET AND MED

IRON MIXTURE : 2 MLS/PIGLET X 160 PIGLETS	2
K6.64/LITRE OF SOLUTION	
NEFTIN SUSPENSION : 10 MLS/PIGLET X 160 PIGLETS	139
K86.84/LITRE OF SUSPENSION	
PIG WORMER : 4 GRAMS/PIG X 171 PIGS	82
100 GRAMS COSTS K12.00	
TERRAMYCINE INJECTION : 20 MLS/SOW X 10 SOWS	34
K172.00/LITRE OF SOLUTION	
CO-CAL PIG SPRAY : 10 MLS/PIG X 171 PIGS	43
K25.20/LITRE OF SOLUTION	
DISINFECTANTS, RUBBER HOSE, SCRUBBING BRUSH ETC.	100
SUB TOTAL	K301
TOTAL VARIABLE COST	K17,877
GROSS MARGIN	K4,590
GROSS MARGIN PER PIG	K29

CAPITAL COSTS:-

BUILDING : PERMANENT OPEN AIR WITH SOLID FLOORING	\$11,000
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SENSITIVITY ANALYSIS:-

TOTAL GROSS MARGIN AT VARIOUS MORTALITY RATES AND FEED COSTS

MORTALITY RATE:

		10 %	15 %	MODEL	25 %	30 %
FEED COSTS:	-20 %	5,650	4,527	7,897	2,280	1,157
	-10 %	3,997	2,873	6,243	627	(497)
	MODEL	2,343	1,220	4,590	(1,027)	(2,150)
	+10 %	690	(433)	2,937	(2,680)	(3,803)
	+20 %	(963)	(2,087)	1,283	(4,333)	(5,457)

SOURCE: ANIMAL HUSBANDRY CENTRE, D.A.L, LABU.

4.1 COST OF TRACTOR OPERATION AND OWNERSHIP.

1. COST OF TRACTOR OPERATIONS

Assumes 5 hour field operating day, 48 week operating year(1,200 hrs/yr)

Working life is 10.00 years

<u>TRACTOR TYPE:</u>	<u>Unit Cost</u>	<u>Terminal resale value</u>
Ford 4610 - 4wd	23,400	2,340

RUNNING COSTS:

	<u>Rate</u>	<u>Unit</u>	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Fuel & oil field	6.50	hr	162.50	7,800
Fuel & oil travel	6.50	hr	65.00	3,120
Driver	1.00	hr	40.00	1,920
Repairs & maint.	1.18	hr	41.44	1,989
VARIABLE RUNNING COSTS::			308.94	14,829

OVERHEAD COSTS:

	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Interest on capital @ 5% (real)	24.38	1,170
Replacement (sinking fund @ 5% real)	32.73	1,571
Insurance, registration, etc..	3.02	145
FIXED OVERHEAD COSTS	60.13	2,886
TOTAL OPERATING COST	369.07	17,715
per hour of field operation:		14.76

SOURCE: D.A.L., ERAP

2. COST OF TRACTOR OPERATIONS

Assumes 5 hour field operating day, 48 week operating year(1,200 hrs/yr)

Working life is 10.00 years

<u>TRACTOR TYPE:</u>	<u>Unit Cost</u>	<u>Terminal</u>
		<u>resale value</u>
Ford 4610 - 2wd	18,200	1,820

RUNNING COSTS:

	<u>Rate</u>	<u>Unit</u>	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Fuel & oil field	6.50	hr	162.50	7,800
Fuel & oil travel	6.50	hr	65.00	3,120
Driver	1.00	hr	40.00	1,920
Repairs & maint.	0.92	hr	32.23	1,547
VARIABLE RUNNING COSTS::			299.73	14,387

OVERHEAD COSTS:

	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Interest on capital @ 5% (real)	18.96	910
Replacement (sinking fund @ 5% real)	25.46	1,222
Insurance, registration, etc..	3.02	145
FIXED OVERHEAD COSTS:	47.44	2,277

TOTAL OPERATING COST	347.17	16,664
per hour of field operation:		13.89

SOURCE: D.A.L., ERAP

3. COST OF TRACTOR OPERATIONS

Assumes 5 hour field operating day, 48 week operating year(1,200 hrs/yr)
 Working life is 10.00 years

<u>TRACTOR TYPE:</u>	<u>Unit Cost</u>	<u>Terminal</u>
		<u>resale value</u>
Ford 6610 - 2wd	22,750	2,275

RUNNING COSTS:

	<u>Rate</u>	<u>Unit</u>	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Fuel & oil field	9.34	hr	233.50	11,208
Fuel & oil travel	9.34	hr	93.40	4,483
Driver	1.00	hr	40.00	1,920
Repairs & maint.	1.15	hr	40.29	1,934
<u>VARIABLE RUNNING COSTS::</u>			<u>407.19</u>	<u>19,545</u>

<u>OVERHEAD COSTS:</u>	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Interest on capital @ 5% (real)	23.70	1,138
Replacement (sinking fund @ 5% real)	31.82	1,528
Insurance, registration, etc..	3.02	145
FIXED OVERHEAD COSTS	58.54	2,810
TOTAL OPERATING COST	465.73	22,355
per hour of field operation:		18.63

SOURCE: D.A.L., ERAP

TRACTOR OPERATING AND OWNERSHIP COSTS

4. COST OF TRACTOR OPERATIONS

Assumes 5 hour field operating day, 48 week operating year(1,200 hrs/yr)

Working life is 10.00 years

<u>TRACTOR TYPE:</u>	<u>Unit Cost</u>	<u>Terminal resale value</u>
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Ford 6610 - 4wd	27,150	2,715
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RUNNING COSTS:

	<u>Rate</u>	<u>Unit</u>	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Fuel & oil field	9.34	hr	233.50	11,208
Fuel & oil travel	9.34	hr	93.40	4,483
Driver	1.00	hr	40.00	1,920
Repairs & maint.	1.37	hr	48.08	2,308
VARIABLE RUNNING COSTS::			414.98	19,919

OVERHEAD COSTS:

	<u>Cost/ Week</u>	<u>Cost/ Year</u>
Interest on capital @ 5% (real)	28.28	1,358
Replacement (sinking fund @ 5% real)	37.98	1,823
Insurance, registration, etc..	3.02	145
FIXED OVERHEAD COSTS	69.28	3,326
TOTAL OPERATING COST	484.26	23,244
per hour of field operation:		19.37

SOURCE: D.A.L., ERAP

CONVERSION TABLES

The bold figures in the central columns can be read as either the metric or the British Imperial measure. Thus 1 inch = 2.54 centimetres; or 1 centimetre = .3937 inch. For tens, move decimal point one place to the right, for hundreds two place; etc. Then convert higher quantities thus: 2ft 9. = 33 in. = 76.2 cm = 83.82 cm.

AREA										AREA									
AREA					AREA					AREA					AREA				
Sq. Inches	Sq. Centimetres	Sq. Yards	Sq. Metres	Sq. Miles	Sq. Kilometres	Acres	Sq. Hectares			Sq. Inches	Sq. Centimetres	Sq. Yards	Sq. Metres	Sq. Miles	Sq. Kilometres	Acres	Sq. Hectares		
15500	1	6.45160	1.19599	1	.83613	.38610	1	2.58999	1	2.47105	1	2.47105	1	2.58999	1	2.47105	1	2.58999	1
31000	2	12.90320	2.39198	2	1.67226	.77220	2	5.17998	2	4.94210	2	4.94210	2	5.17998	2	4.94210	2	5.17998	2
46500	3	19.35480	3.58797	3	2.50839	1.15830	3	7.76997	3	7.41315	3	7.41315	3	7.76997	3	7.41315	3	7.76997	3
62000	4	25.80640	4.78396	4	3.34453	1.54440	4	10.35996	4	9.88420	4	9.88420	4	10.35996	4	9.88420	4	10.35996	4
77500	5	32.25800	5.97995	5	4.18065	1.93050	5	12.94995	5	12.35525	5	12.35525	5	12.94995	5	12.35525	5	12.94995	5
93000	6	38.70960	7.17594	6	5.01678	2.31660	6	15.53994	6	14.82630	6	14.82630	6	15.53994	6	14.82630	6	15.53994	6
108500	7	45.16120	8.37193	7	5.85291	2.70270	7	18.12993	7	17.29735	7	17.29735	7	18.12993	7	17.29735	7	18.12993	7
124000	8	51.61280	9.56792	8	6.68904	3.08880	8	20.71992	8	19.76840	8	19.76840	8	20.71992	8	19.76840	8	20.71992	8
139500	9	58.06440	10.76391	9	7.52517	3.47490	9	23.30991	9	22.23945	9	22.23945	9	23.30991	9	22.23945	9	23.30991	9

CAPACITY										CAPACITY									
CAPACITY					CAPACITY					CAPACITY					CAPACITY				
Inches	Centimetres	Miles	Kilometres	Pints	Litres	Gallons	Litres			Inches	Centimetres	Miles	Kilometres	Pints	Litres	Gallons	Litres		
393700	1	2.54000	1.60934	1	1.75976	.21997	1	5.6726	1	4.54609	1	4.54609	1	1.75976	1	4.54609	1	4.54609	1
787402	2	5.08000	3.21869	2	3.51952	.43994	2	1.13652	2	9.09218	2	9.09218	2	3.51952	2	9.09218	2	9.09218	2
1181102	3	7.62000	4.82803	3	5.27928	.65991	3	1.70478	3	13.63827	3	13.63827	3	5.27928	3	13.63827	3	13.63827	3
1574803	4	10.16000	6.43738	4	7.03904	.87988	4	2.27305	4	18.18436	4	18.18436	4	7.03904	4	18.18436	4	18.18436	4
1968504	5	12.70000	8.04672	5	8.06855	1.09985	5	2.84131	5	22.73045	5	22.73045	5	8.06855	5	22.73045	5	22.73045	5
2362205	6	15.24000	9.65606	6	9.72826	1.31982	6	3.40957	6	27.27654	6	27.27654	6	9.72826	6	27.27654	6	27.27654	6
2755906	7	17.78000	11.26541	7	12.31832	1.53979	7	3.97783	7	31.82263	7	31.82263	7	12.31832	7	31.82263	7	31.82263	7
3149606	8	20.32000	12.87475	8	14.07808	1.75976	8	4.54609	8	36.36872	8	36.36872	8	14.07808	8	36.36872	8	36.36872	8
3543307	9	22.86000	14.48410	9	15.83784	1.97973	9	5.11435	9	40.91481	9	40.91481	9	15.83784	9	40.91481	9	40.91481	9

POWER										POWER									
POWER					POWER					POWER					POWER				
Pounds	Kilograms	Tons*	Horsepower	Kilowatts	Pounds	Kilograms	Tons*	Horsepower	Kilowatts	Pounds	Kilograms	Tons*	Horsepower	Kilowatts	Pounds	Kilograms	Tons*	Horsepower	Kilowatts
2204622	1	.453592	.000984	1	1016.0469	1.341022	1	1.341022	.7457	35.31467	1	.02832	35.31467	1	.02832	35.31467	1	.02832	.7457
4409244	2	.907184	.001968	2	2032.0938	2.682044	2	2.682044	1.4914	70.62934	2	.05664	70.62934	2	.05664	70.62934	2	.05664	1.4914
6613866	3	1.360776	.002952	3	3048.1407	4.023066	3	4.023066	2.2371	105.94401	3	.08496	105.94401	3	.08496	105.94401	3	.08496	2.2371
8818488	4	1.814368	.003936	4	4064.1876	5.364088	4	5.364088	2.9828	141.25868	4	.11328	141.25868	4	.11328	141.25868	4	.11328	2.9828
11023110	5	2.267960	.004920	5	5080.2345	6.705110	5	6.705110	3.7285	176.57335	5	.14160	176.57335	5	.14160	176.57335	5	.14160	3.7285
13227732	6	2.721552	.005904	6	6096.2814	8.046132	6	8.046132	4.4742	211.88802	6	.16992	211.88802	6	.16992	211.88802	6	.16992	4.4742
15432354	7	3.175144	.006888	7	7112.3283	9.387154	7	9.387154	5.2199	247.20269	7	.19824	247.20269	7	.19824	247.20269	7	.19824	5.2199
17636976	8	3.628736	.007872	8	8128.3752	10.728176	8	10.728176	5.9656	282.51736	8	.22656	282.51736	8	.22656	282.51736	8	.22656	5.9656
19841598	9	4.082328	.008856	9	9144.4221	12.069198	9	12.069198	6.7113	317.83203	9	.25488	317.83203	9	.25488	317.83203	9	.25488	6.7113

*1 metric tonne = 1,000 kg

WEIGHTS AND MEASURES TABLE

METRIC		Energy	
Linear Measure		Square Measure	
10 millimetres	1 centimetre	100 sq. millimetres	1 sq. centimetre
10 centimetres	1 decimetre	100 sq. centimetres	1 sq. decimetre
10 decimetres	1 metre	100 sq. decimetres	1 sq. metre
10 metres	1 decametre	100 sq. metres	1 sq. decametre
10 decametres	1 hectometre	100 sq. decametres	1 sq. hectometre
100 hectometres	1 kilometre	100 sq. hectometres	1 sq. kilometre
Liquid Measure		Weights	
10 Millilitres	1 centilitre	10 milligrams	1 centigram
10 centilitres	1 decilitre	10 centigrams	1 decigram
10 decilitres	1 litre	10 decigrams	1 gram
10 litres	1 decalitre	10 grams	1 decagram
10 decalitres	1 hectolitre	10 decagrams	1 hectogram
10 hectolitres	1 kilolitre	10 hectograms	1 kilogram
		100 kilograms	1 quintal
		10 quintals	1 tonne
IMPERIAL		Square Measure	
Long Measure		Cubic Measure	
12 inches	1 foot	1728 cubic inches	1 cubic foot
3 feet	1 yard	27 cubic feet	1 cubic yard
5 1/2 yards	1 rod	128 cubic feet	1 cord (wood)
30 rods	1 furlong	40 cubic feet	1 ton (shipping)
8 furlongs	1 statute mile	2,150.42 cubic inches	1 standard bu
3 miles	1 league	231 cubic inches	1 US standard gal
		1 cubic foot	about 4/5 of a bushel
Angular Measure		Avoldrupois Weight	
60 seconds	1 minute	27 11/32 grains	1 dram
60 minutes	1 degree	16 drams	1 ounce
30 degrees	1 sign	16 ounces	1 pound
90 degrees	1 quadrant	28 pounds	1 quarter
4 quadrants or 360°	1 circumference or great circle	4 quarters	1 cwt
		2,000 pounds	1 short ton
		2,240 pounds	1 long ton