

Setting Policy Priorities for the Development of Tree Crop Industries in Papua New Guinea

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Introduction

A set of assessments of policy options is made in this paper to identify policy priorities for the development of the tree crops sub-sector. The assessments are made on the basis of the four guiding principles for the period 1995 to 2000 and beyond presented by DAL (1995a, p. iii):

- concentration on investment programs with high returns to production, exports and employment, and minimal adverse effect on the environment
- alleviation of the more serious constraints on agricultural production to improve productivity
- creation of an environment conducive to greater private sector participation
- provision of people and support services to implement government projects effectively.

For each policy option, a summary is presented in a box detailing its advantages and disadvantages. Details are also provided of the implementing agencies of the policy were it to be implemented, its rating on the criteria of potential impact, efficiency, equity, practicality and the extent of the risk of an adverse outcome. The assessment of the empirical evidence is based on material presented by Fleming and Yala (2001).

No perfect way exists to assign weights to the various advantages and disadvantages of policies presented in the boxes. We have simply applied our subjective views on the relative importance of each advantage/disadvantage in terms of its welfare-altering potential, and the risks and hazards of adverse impacts.



Commodity price stabilisation

The weight of evidence in Box 1 is against the reintroduction of price stabilisation schemes. If they are to be introduced, industry organisations should operate them on a strictly self-funding basis. A preferred approach is to stabilise incomes of producers directly rather than stabilise product prices, by means that do not rely on government intervention in product markets.

Box 1 - Assessment of Commodity Price Stabilisation

Advantages

Reduction in price variability can reduce income variability and improve the welfare of risk-averse smallholders.

Reduction in export revenue variability can aid macroeconomic stabilisation.

Clearer trends in producer prices of tree crops can improve production and investment decisions at the farm level.

Reduction in price variability can encourage smallholders to maintain their plantations when world prices are low, reducing the risk of long-term decline in the yield potential of trees or palms.

Disadvantages

Price stabilisation does not necessarily translate into more stable smallholder incomes.

The macroeconomic importance of the tree crops sub-sector in economic stabilisation has been substantially reduced in recent times.

Forecasting trends in world commodity prices is very hazardous, and requires considerable time inputs by skilled and experienced people who have high opportunity costs.

Incorrect forecasts of price trends by managers of stabilisation schemes can send the wrong price signals to producers and result in inappropriate levels of stabilisation funds.

Undue political pressures can be placed on managers of stabilisation funds.

Anomalies can occur in setting levies and bounties, and the transfer of bounties back to producers.

Advantages

Disadvantages

The level of aversion by smallholders to price risk can be overstated because they commit only small amounts of cash to production and have proved capable of managing their price risks on their own.

Moral hazard can be a problem where there is an expectation that the national government will step in to provide support to schemes when they run out of funds.

The nature of fluctuations in export prices in tree crop industries is not conducive to the effective operation of price stabilisation schemes.

Implementing Agencies

Industry corporations and/or boards

Rating

Potential impact:moderate
Efficiency:low to moderate
Equity:moderate
Practicality:low
Risk of adverse economic outcome:moderate to high.



ASSESSMENT OF POLICY OPTIONS

Government sponsorship of industry participation in risk markets

The evidence presented in Box 2 supports further investigation of participation in risk markets by industry participants, using international support and national government assistance where appropriate.

Box 2 - Assessment of Industry Participation in Risk Markets

Advantages	Disadvantages
Risk management decisions are placed in the hands of producers and exporters rather than the government.	The nature of export price fluctuations for tree crops is not amenable to hedging under certain market conditions (for example, in the middle of an extended period of stable and low prices).
Positive welfare effects can be derived from hedging operations that help reduce risks of future falls in export prices.	Where exporters use hedging, it is difficult to ensure that some of the benefits of a more stable price will flow back to smallholders.
Timely international support is likely to become available as the International Task Force on Commodity Risk Management in Developing Countries develops new approaches to manage vulnerability to fluctuations in commodity prices.	It is doubtful whether the International Task Force on Commodity Risk Management in Developing Countries can introduce schemes tailored precisely to meet the needs of smallholders. The export marketers of tree crops are likely to benefit most.
Macroeconomic management can be aided in a modest way.	There are still severe practical difficulties limiting participation by smallholders in hedging activities.

Implementing Agencies

International Task Force on Commodity Risk Management in Developing Countries
Tree crop industry participants – Private financial institutions – National government (as a facilitator)
Rating

Potential impact:moderate
Efficiency:high
Equity:moderate
Practicality:medium
Risk of adverse economic outcome:low.

Government sponsorship of crop insurance

The option presented in Box 3 of government sponsorship of crop insurance has little to recommend it.

Box 3 - Assessment of Crop Insurance

Advantages	Disadvantages
Crop insurance provides a market-based solution to downside risk that would be available to both estates and smallholders.	The tool is better suited to managing yield risk than price risk. Yet the latter is of more concern in tree crop industries.
It places the risk management decisions in the hands of the producer.	Premiums are likely to be very high, especially for smallholders.
Government involvement is unlikely to distort market signals.	It would be very difficult to establish a competitive and viable crop insurance market in Papua New Guinea.

Implementing Agencies

National government – Private sector

Rating

Potential impact: .....	.low
Efficiency: .....	.moderate to high
Equity: .....	.low to moderate
Practicality: .....	.low
Risk of an adverse outcome: .....	.high.



ASSESSMENT OF POLICY OPTIONS

Provision of market information

A better and more integrated system for gathering, analysing and disseminating market information would be a valuable complement to the activities of participants in risk markets in tree crop industries. It should provide greater transparency in prices, and broader and more timely dissemination of price signals to those responsible for managing market risks.

The industry organisations seem best placed for the role of improving market information. Some form of financial assistance from the national government and international agencies might be desirable in helping them to develop a more appropriate information system.

Price support policies

The merits of any future commitment by the national government to support tree crop prices in the short term are assessed in Box 4. There could conceivably be circumstances of dire temporary hardship in the tree crop industries that might prompt the national government to provide short-term price support in the future. But such an action should be taken as a last resort, conservatively and according to a strict 'sunset clause'.

Box 4 - Assessment of Short-Term Price Support

Advantages	Disadvantages
<p>In extended periods of low export prices, price support can provide welfare gains to smallholders, estates, processors and exporters.</p> <p>Short-term price support can help maintain the productive base of tree crop industries in extended periods of low export prices. Producers are more likely to carry out maintenance activities, and the processing and marketing capacities are more likely to be retained within the industries.</p>	<p>Adverse macroeconomic impacts are likely to result from the provision of price support. This impact increases substantially the longer the period of support and the higher its level.</p> <p>Price support can distort messages to producers in tree crop industries about the direction of price trends if recovery in export prices is incorrectly predicted. It also has an opportunity cost.</p>

Advantages

The beneficial social and economic impacts of price support flow to large numbers of people and industries dependent on the prosperity of the tree crops sub-sector.

Many of the beneficiaries are among the poorer members of society.

Disadvantages

It is extremely difficult to forecast the length of time for which price support may be needed, the appropriate level of that support, and how long into an industry recession it should be introduced.

Moral hazard is a potentially severe problem.

There is a risk that procedures for managing and distributing funds might not be transparent.

Political pressures make it difficult for decisions to be made on the social and economic merit of the support offered.

Administrative difficulties may be encountered in managing the disbursement of funds.

WTO rules could be violated in the future.

Implementing Agencies

National government – Industry boards and/or corporations

Rating

Potential impact: .....	.high
Efficiency: .....	.moderate
Equity: .....	.moderate
Practicality: .....	.low to moderate
Risk of adverse economic outcome: .....	.high.



Intervention for product quality improvement

Situations are likely to arise when product quality schemes are justified on the evidence presented in Box 5, but each initiative should be preceded by careful economic analysis. Because they are market-based initiatives, the main actors would be expected to be in the private sector. Pricing policies adopted by marketers are critically important; nevertheless, the industry organisations would have important facilitatory and regulatory roles.

Box 5 - Assessment of Product Quality Improvement

Advantages

There is some evidence of a decline in product quality in some tree crop industries, suggesting there is scope for making up lost ground.

Improvements in product quality can be a cost-effective means of achieving increases in farm-gate prices for tree crop products in markets where producers are price-takers. Evidence exists of some success in the smallholder coffee industry.

Higher prices per unit of output from quality improvements can induce a positive supply response by producers.

Product quality improvement through better grading facilitates more careful identification of buyer needs and specification of product attributes. This can lead to increased prices at both the export and producer levels.

Disadvantages

An improvement in product quality does not always lead to an increase in export price.

It is not sufficient to demonstrate a quality improvement, as it might not produce net economic benefits. Yet, it can be difficult to determine, ex ante, whether an action to improve product quality will yield positive net benefits.

The positive response from higher prices is offset by the dampening effects on incentives of the increased costs of producing a higher quality product.

Not all tree crop industries are likely to be able to exploit product quality improvements to raise export prices. Most benefits will accrue to the cocoa and coffee industries.

Advantages

Product quality improvement can encourage adherence by exporters to export quality grade specifications in industry regulations. This can enhance the international reputation of Papua New Guinea as an exporter of high-quality tree crop products, and lead to increased prices at both the export and producer levels.

Improved quality and grading of tree crop products can improve chances of competing successfully in remunerative niche export markets through product differentiation and a stronger bargaining position.

Disadvantages

Reliance on regulation alone is unlikely to lead to improvements in tree crop quality.

Separate actions at one particular level in the marketing chain have so far proved ineffective in leading to an improvement in the quality of the final export product.

Implementing Agencies

Industry boards and/or corporations – Private sector

Rating

Potential impact:moderate
Efficiency:moderate to high
Equity:moderate
Practicality:moderate
Risk of adverse economic outcome:low.



Government intervention to encourage downstream processing

Evidence presented in Box 6 suggests that the potential is limited for government intervention to encourage downstream processing. A direct involvement in any downstream processing investments by the national government or industry organisations should be avoided, leaving it to the private sector to undertake such investments. The best forms of government action are to improve the commercial, political and regulatory environments, and to streamline the guidelines and procedures for foreign investment.

Box 6 - Assessment of Government Support for Downstream Processing

Advantages	Disadvantages
Downstream processing offers potential for greater control over export price movements by the incorporation of value-adding activities that are less susceptible to price variability.	Use of downstream processing to reduce price variability relies on the economic viability of the activities involved. This is often lacking because it is capital- and technology-intensive, and unsuited to economic conditions in Papua New Guinea.
Value-adding activities might contribute to increased industry profitability.	Control over more downstream activities does not automatically reduce export price variability.
Positive secondary outcomes of value adding should increase employment in rural areas.	Greater non-price competition often exists in the export market for a more processed product.

Implementing Agencies

National government (facilitatory and regulatory roles)
 Industry boards/corporations (facilitatory role) – Private sector

Rating

Potential impact:low
 Efficiency:low
 Equity:moderate
 Practicality:low
 Risk of adverse economic outcome:high.

Generic promotion

Prospects for successful product promotion at the industry level are not high for homogeneous products such as most tree crop products (Box 7). Generic promotion is unlikely to alter consumption patterns to increase their overall demand.

Box 7 - Assessment of Product Promotion

Advantages	Disadvantages
<p>Potential exists to increase the export demand for tree crop products of Papua New Guinea through carefully focused promotion of tree crop exports.</p>	<p>Generic promotion seldom yields gains for commodity exports that are not easily differentiated. It is exceptionally difficult for the coconut, oil palm and rubber industries where the features of the final products are little influenced by the quality of the raw product.</p>
<p>Exporters could enhance their bargaining position by marketing products that have been effectively promoted.</p>	<p>Effective promotion of exports usually relies on a product differentiation strategy to be in place; this is rare for smallholder exports of tree crop products.</p>
	<p>It is difficult for small countries to implement promotional campaigns and measure the gains from promotion.</p>

Implementing Agencies

Industry corporations and/or boards – Private sector

Rating

Potential impact	low
Efficiency:	moderate
Equity:	low
Practicality:	low
Risk of adverse economic outcome:	low



Subsidies on purchased inputs

Overall, input subsidies are undesirable (Box 8) unless it can be clearly demonstrated that four stringent conditions hold. They are (a) environmental degradation is occurring, at significant social cost, (b) producers are not taking adequate action in their input usage to prevent it, (c) the social benefits of the input subsidy to offset the environmental degradation outweigh its social costs, and (d) other environmental policies are not effective.

Box 8 - Assessment of Input Subsidies

Advantages

Certain purchased inputs are currently used in sub-optimal quantities in tree crop production, due to market imperfections such as lack of information about their benefits.

Subsidies have the potential to increase industry profitability by expanding the use of the subsidised inputs to optimal levels.

Subsidies on inputs that protect the tree crops environment can lead to substantial net social benefits.

Disadvantages

Evidence suggests these subsidies are only likely to have a significant beneficial impact in the estate sector for the foreseeable future.

Subsidies are likely to distort input usage patterns if offered for an extended period, and it is difficult to ascertain how long they should be maintained.

Evidence exists of economic welfare losses in most tree crop industries in Papua New Guinea arising from the provision of subsidies on purchased inputs.

Input subsidies require effective support services if they are to be implemented successfully.

They can be politically difficult to remove.

Their provision may contravene WTO rules in the future.

Implementing Agency

National government

Rating

Potential impact: moderate

Efficiency: low to moderate

Equity: low

Practicality: moderate

Risk of adverse economic outcome: moderate to high.

Tree planting subsidies

A reasonably strong case can be made for counter-cyclical tree planting and maintenance subsidies on the basis of the assessment presented in Box 9. The major role in the provision of these subsidised seedlings would reside with the industry organisations while the national government could provide some funds for the subsidy.

Box 9 - Assessment of Counter-Cyclical Planting and Maintenance Subsidies

Advantages	Disadvantages
Counter-cyclical planting and maintenance subsidies could be used to synchronise more closely trees coming into full bearing with an upswing in prices in the commodity cycle. This should increase industry profitability.	There is no guarantee that the subsidies would offer producers sufficient incentives to respond positively when an industry is in recession.
They would assist in keeping producers in their plantations during industry recessions, encouraging more maintenance in plantations and preservation of their productive base.	Estimates of beneficial effects are predicated on a continuation of past patterns of commodity cycles.
There is a possibility to target especially needy groups of producers.	It would be difficult to judge the correct level of subsidy, requiring skilled management. There could be an element of moral hazard.

Implementing Agencies

National government - Provincial governments
Industry boards/corporations

Rating

Potential impact:low to moderate
Efficiency:low to moderate
Equity:moderate
Practicality:moderate
Risk of adverse economic outcome:low to moderate.



ASSESSMENT OF POLICY OPTIONS

Altering the opportunity cost of labour

The national government bears responsibility for wage legislation and labour market reform. On the evidence presented in Box 10, the case for a return to minimum wage legislation is very weak.

Box 10 - Assessment of a Minimum Wages Policy

<u>Advantages</u>	<u>Disadvantages</u>
Minimum rural wages are a means of guaranteeing to rural employees minimum living standards that are socially acceptable.	Employers in rural areas generally pay above the rural minimum wage, making it largely ineffective.
They provide a standard by which estates can establish piece rates.	The setting of a rural minimum wage is difficult to enforce given the many different ways and forms in which remuneration is made in rural areas.
	If effective, it could lead to an increase in the opportunity cost of labour in rural areas, lessening the profitability and attractiveness of tree crop production and reducing rural employment levels.

Implementing Agency

National government

Rating

Potential impact	.....low
Efficiency:	.....low
Equity:	.....moderate to high
Practicality:	.....low
Risk of adverse economic outcome:	.....moderate.

Land reform

Arguments for and against land reform, presented in Box 11, are evenly balanced. From the available evidence, it is difficult to reach a clear conclusion on the best way forward. There is some scope for the national government to persevere with modest initiatives that improve land use within the existing land tenure system.

Box 11 - Assessment of Land Tenure Reform

Advantages

Security of land rights of individual households is not guaranteed under the current system, possibly retarding initiatives to develop tree crop plantations.

Not all benefits and costs of using land for tree cropping accrue to the person making the investment.

Property rights are not universally transferable from one landowner to another in a voluntary exchange, discouraging efficient land use.

Attempts to use land for tree crop production under land settlement schemes within the current land tenure system have rarely been successful.

Women continue to be disadvantaged by the current land tenure system.

Disadvantages

High information costs and imperfect financial and risk markets make communal land ownership preferable to private ownership in the current circumstances and stage of economic development.

Abandonment of communal land ownership for fully tradeable property rights can be expected to lead to the loss of a safety net for the rural poor and reduced flexibility for smallholders to manage risks.

Customary land ownership is flexible, and is evolving over time in response to changing needs in land use.

There are likely to be high costs of maintaining land records and negotiating and policing property rights if land were to be alienated.

Evidence is far from clear on the extent to which communal land ownership currently constrains the development of tree crop industries. The situation appears to vary from one area to another.

Implementing Agency

National government
Rating

Potential impact:high
Efficiency:moderate to high
Equity:low to moderate
Practicality:low
Risk of adverse economic outcome:high.



Government intervention in rural financial markets to improve saving

A strong case can be made for improving rural financial markets, and saving facilities in particular (Box 12). The national government has the lead role in this endeavour, assisted by the activities of the commercial financial sector and non-government organisations that have the ability to operate as facilitators in finance schemes that closely meet the needs of smallholders.

Box 12 - Assessment of Improved Facilities for Rural Saving

Advantages

Rural saving is encouraged by offering better financial services and enabling more attractive returns to be offered on deposits.

Counter-cyclical saving behaviour is encouraged, which is a parsimonious way to assist smallholder households to manage income variability over time.

Improved rural saving opportunities can lead to modest increases in on-farm investment.

It is possible to target specific disadvantaged tree crop producers, most notably those in more remote areas.

It should be possible to take advantage of the accumulating evidence on how to operate successful rural saving schemes in developing countries.

Benefits flow more widely than the tree crop industries, to the rural sector in general.

Disadvantages

Considerable resources and effort would be needed to bring about a marked improvement in rural financial services.

Organisational skills are needed to develop ways in which commercial principles are not violated while at the same time making facilities universally accessible and attractive to rural residents.

Financial risks are ever present.

It is likely that the commercial banking system will need to be involved in some way. Providing the necessary incentives to them can be tricky.

It will take a long time to develop the financial system to the stage at which incentives to small savers are attractive.

Advantages

Disadvantages

Government intervention is unlikely to distort financial market operations or incentives, and should reduce distortions through more efficient financial operations.

Implementing Agencies

National government – Commercial financial sector
Non-government organisations (as facilitators)

Rating

- Potential impact:high
- Efficiency:high
- Equity:high
- Practicality:low
- Risk of adverse economic outcome:moderate.

Implementing Agencies

National government – Financial Development Bank

Rating

- Potential impact:low to moderate
- Efficiency:low
- Equity:low to moderate
- Practicality:moderate
- Risk of adverse economic outcome:high



ASSESSMENT OF POLICY OPTIONS

Subsidised interest rates for rural loans

The case for persevering with subsidised interest rates is weak, as indicated by the assessment presented in Box 13. The major actors in their provision would be the national government and the Rural Development Bank.

Box 13 - Assessment of Subsidised Interest Rates on Rural Credit

Advantages	Disadvantages
<p>The subsidisation of interest rates can be used to encourage the adoption of improved production practices in tree crop industries. This is particularly the case when efforts are being made to encourage the adoption of improved technologies embodied in purchased inputs or seedlings.</p> <p>Interest rate subsidies are capable of being targeted at specific groups of tree crop producers.</p>	<p>Interest rate subsidies can badly affect the development of rural financial markets. In particular, they discourage the development of rural saving facilities.</p> <p>They can also cause distortions in input use.</p> <p>They are susceptible to abuse through rent-seeking, with subsidised loans being redirected away from the intended beneficiaries.</p> <p>The use of subsidies on interest rates is at odds with the terms of the current structural adjustment program.</p>

Implementing Agencies

National government – Rural Development Bank

Rating

Potential impact: .....	.low to moderate
Efficiency: .....	.low
Equity: .....	.low to moderate
Practicality: .....	.moderate
Risk of adverse economic outcome .....	.high.

Future role of research and extension

Assessments of the merits of government investment in research and extension, and specifically research and extension directed towards sustainability and farm-level diversification in the tree crops sub-sector, are presented in Boxes 14 and 15, respectively. The case is overwhelming for continued funding of tree crops research and extension, on a joint basis with the industries themselves.

The arguments favouring government sponsorship of research into improved diversification activities are particularly compelling. But evidence that not all funds allocated to research and extension have been profitably utilised in the past suggests that each individual program or project should be more closely scrutinised and monitored in the future.

Industry corporations, through their research and extension arms, are expected to play the main role in introducing improved technologies in tree crop production. But their activities need to be more closely integrated with those of extension personnel at the provincial level and producers themselves than they have in the past. This is especially so in efforts to facilitate profitable farm-level diversification.

Box 14 - Assessment of Agricultural Research and Extension

Advantages

Investment in research and extension provides one of the most potent means of increasing the supply of tree crops through the introduction of improved technologies.

It also can contribute to the improved quality of tree crop products.

There is some evidence of high rates of return to investment in tree crops research in Papua New Guinea, and in developing countries in general.

Disadvantages

Evidence to date suggests tree crops research and extension divisions have not worked very effectively together.

Much tree crops research work to date has not focused sufficiently on the needs of smallholders.

Doubts remain over the efficacy of extension work in the tree crop industries, and its ability to improve the technical efficiency of individual producers and extend new technologies to smallholders.



ASSESSMENT OF POLICY OPTIONS

Advantages

Evidence also exists of substantial technical inefficiencies in smallholder tree crop production, providing considerable scope for extension work to move farmers close to 'best-practice' operations.

There is a strong public good component of tree crops research, with potentially large external and secondary benefits to the rest of the economy, especially in rural areas.

Disadvantages

A considerable volume of tree crops research work in Papua New Guinea has not yet been subject to economic evaluation.

Problems are likely in soliciting levies for research and extension from producers of tree crops in times of industry recession.

Implementing Agencies

National government

Research and extension agencies in industry boards/corporations

National Agricultural Research Institute - Provincial extension agencies

Rating

Potential impact:high
Efficiency:high
Equity:moderate to high
Practicality:low to moderate
Risk of adverse economic outcome:low.

Box 15 - Assessment of Research into Farm-Level Diversification

Advantages

Diversification at the farm level offers proven and substantial benefits to smallholders by increasing farm incomes and reducing production and price risks. It is consistent with the philosophy underlying current economic reform.

Tree crop producers in Papua New Guinea have already shown themselves adept at modifying their diversification strategies to suit changing economic and physical conditions.

Diversification provides a sustainable means of risk management once adopted.

Intercropping can enhance the sustainability of tree crops-based farming systems.

Benefits flow largely to smallholders.

Government need not intervene in product markets

Disadvantages

Many of the crops tried as part of a diversification strategy have been unsuccessful. This has been for a variety of reasons but especially marketing constraints that are difficult to resolve through public research.

Opportunities to benefit from reduced risk and increased productivity are likely to be unevenly distributed between tree crop industries. The coffee, cocoa and copra industries are much more likely to benefit than the oil palm industry.

A heavy reliance is placed on effective research activities, and research-extension linkages. They are critical if diversification is to allow farmers to benefit from improved technologies.

Farm-level diversification does not always translate into reduced variability in farm incomes.

Implementing Agencies

Tree crops research institutes – Provincial extension agencies
Tree crop producers

Rating

Potential impact:high
Efficiency:high
Equity:high
Practicality:low to moderate
Risk of adverse economic outcome:low.



ASSESSMENT OF POLICY OPTIONS

The future role of rural infrastructure

The merits of government investment in rural infrastructure, and its maintenance and rehabilitation, are exceptionally strong given the convincing arguments in favour that are presented in Boxes 16 and 17, respectively. On balance, they are stronger for maintenance and rehabilitation of existing infrastructure than for new construction.

Provincial and local governments, as well as the national government, are likely to play an important role in developing transport infrastructure. Most of the feeder roads are provincial roads and, thus, maintenance and rehabilitation are the responsibility of the respective provincial and local government councils. It should be acknowledged that the ability to undertake capital works programs is likely to vary widely among the provincial and local administrations.

Box 16 - Investment in Rural Infrastructure

Advantages	Disadvantages
Investments in rural infrastructure offer considerable potential to reduce marketing costs, thereby raising farm-gate prices.	Investment in rural infrastructure is typically very expensive and difficult, and takes a long time to reach fruition.
They also offer potential to reduce any supernormal profits of marketers by encouraging greater competition, thereby also raising farm-gate prices.	Experience suggests that rapid deterioration occurs in the working condition of rural infrastructure in Papua New Guinea.
Greatest benefits are likely to flow to more remote producers, who tend to be among the poorer members of the rural sector.	Infrastructural development encourages rent-seeking, as individuals and groups seek to capture the investment in infrastructure for a particular district or region.
Substantial areas with high development potential for tree crops development could be tapped with further infrastructural development.	Some socially undesirable trends and patterns can ensue from infrastructural development.
Benefits extend well beyond tree crop industries, leading to greater general rural well-being.	There is potential for damage to the physical environment.

Advantages

It is possible to target specific disadvantaged groups.

The construction of infrastructure is unlikely to distort market prices for inputs or outputs. At the same time, it facilitates information flow, making producers better informed about market conditions and production methods.

Disadvantages

Infrastructure relies for its effectiveness on the concomitant development of the rural economic and social services that use it.

Implementing Agencies

National government – Provincial and local governments

Rating

Potential impact:high
Efficiency:high
Equity:moderate to high
Practicality:low
Risk of adverse economic outcome:moderate.



ASSESSMENT OF POLICY OPTIONS

Box 17 - Maintenance and Rehabilitation of Rural Infrastructure

Advantages

Maintenance and rehabilitation of rural infrastructure offer considerable potential to reduce marketing costs, thereby raising farm-gate prices.

They also offer potential to reduce any supernormal profits of marketers by encouraging greater competition, thereby also raising farm-gate prices.

Greatest benefits are likely to flow to more remote producers who tend to be among the poorer members of the rural sector. This is because infrastructure in more remote rural regions usually suffers more from a lack of adequate attention.

Benefits extend well beyond tree crop industries, leading to greater general rural well-being.

It is possible to target specific disadvantaged groups.

Maintenance and rehabilitation activities are unlikely to distort market prices for inputs or outputs.

At the same time, they facilitate information flow, making producers better informed about market conditions and production methods.

Disadvantages

Although maintenance and rehabilitation of infrastructure are a cheaper option than investment, they can still be expensive and difficult.

Ensuring adequate funds are available and appropriately used for maintenance and rehabilitation is fraught with difficulties.

Implementing Agencies

Various levels of government – Estates (in some cases)

Local community groups

Rating

Potential impact:high

Efficiency:high

Equity:moderate to high

Practicality:low to moderate

Risk of adverse economic outcome:low.

Government subsidisation of rural freight costs

Arguments presented in Box 18 are evenly balanced for and against the introduction by the national government of carefully targeted rural freight subsidies. If introduced, it should be a temporary measure pending improvements in rural infrastructure; yet such temporary arrangements are notoriously difficult to eliminate.

Box 18 - Rural Freight Subsidies

Advantages	Disadvantages
Rural freight subsidies reduce marketing costs, thereby raising farm-gate prices and farm profits, other factors remaining unchanged.	Some difficulties are likely to be encountered in supervising the operation of a rural freight subsidy scheme.
They should also encourage greater competition among buyers, thereby also raising farm-gate prices.	Freight subsidies might contravene the stipulations in the structural adjustment program.
Greatest benefits are likely to flow to more remote producers, who tend to be among the poorer members of the rural sector, as freight costs are a more significant cost item for these producers.	Rural freight subsidies might cause allocative inefficiency by introducing distortions in land use patterns. Production of tree crops would be encouraged in areas where it is not economic.
Benefits extend well beyond tree crop industries, leading to greater general rural well-being.	They are not a sustainable policy option. Yet, once introduced, they are politically difficult to remove.
It is possible to target specific disadvantaged groups in a convenient way.	The subsidies could encourage some rent-seeking activity.
Such activities as are encouraged by freight subsidies are unlikely to distort market prices to a significant extent.	

Implementing Agency

National government

Rating

Potential impact:moderate
 Efficiency:low to moderate
 Equity:moderate to high
 Practicality:moderate
 Risk of adverse economic outcome:low.



ASSESSMENT OF POLICY OPTIONS

Counter-cyclical spending on public services

A strong case is made in Box 19 for the introduction of counter-cyclical funding, as a component of more effective rural health and nutrition services that are adequately funded by the national and provincial governments.

Box 19 - Counter-cyclical Funding of Public Goods

Advantages

The counter-cyclical funding of public goods such as health, nutrition, education and training services helps to maintain welfare and human capital stock at times when rural people are most vulnerable and least able to pay for these goods. A reduction in consumption of these public goods can have an irreversible impact on the stock of human capital.

It helps to emphasise the important point that stabilisation is concerned with more than merely stabilising prices but, more generally, maintaining reasonably stable levels of overall welfare through the consumption of both private and public goods.

This form of government intervention does not distort commodity markets.

It is possible to target especially needy and vulnerable groups of rural people.

Disadvantages

Such a policy places additional demands on fiscal planning, and can create practical obstacles to implementation.

Public funds are likely to be relatively less abundant in times of economic downturn in the tree crop industries.

Implementing Agencies

National government – Provincial governments – Non-government organisations

Rating

Potential impact: moderate

Efficiency: moderate to high

Equity: high

Practicality: moderate

Risk of adverse economic outcome: low.

Devaluation of the kina

An assessment of the merits of further devaluation of the kina is presented in Box 20. The real effective exchange rate has declined progressively and substantially since 1991, and the case for further devaluation of the kina is not persuasive given current economic circumstances.

Box 20 - Devaluation of the Kina

Advantages	Disadvantages
Devaluation of the kina offers an expedient way to increase the domestic value of exports and increase profits in export-oriented industries such as tree crops.	The scope for using devaluation as a tool to improve performance in the tree crops sub-sector is restricted by the need to confine changes to limits imposed by macroeconomic fundamentals.
Smallholders are especially assisted as they purchase only small amounts of imported inputs that become more expensive with devaluation.	Recent large depreciations in the value of the kina leave little room for further devaluations.
Evidence is strong that smallholders respond positively in supply to exchange rate changes. Higher kina values for products can be expected to encourage increases in supply and plantings.	Evidence on the supply response by tree crop estates to devaluation is mixed, with some producers apparently responding negatively.
Distortions to markets are avoided so long as the extent of the devaluation is not out of alignment with macroeconomic fundamentals.	Devaluation is not an effective tool when price support is in place at levels that counter the effects of any change in export prices on the supported producer prices. This limits its usefulness as a stabilisation measure.

Implementing Agency

National government

Rating

Potential impact:low to moderate
 Efficiency:high
 Equity:moderate
 Practicality:high
 Risk of adverse economic outcome:low.



ASSESSMENT OF POLICY OPTIONS

Trade policy

Views differ on the effects of government trade interventions on the economy in Papua New Guinea, but there is enough evidence to conclude that protectionist policies have had an adverse impact. An assessment of the merits of a policy of reducing tariffs and taxes on agricultural inputs is presented in Box 21. There is at present limited scope to assist tree crop producers, especially smallholders, directly by further reductions in tariffs or taxes on farm inputs. But the national government should not be diverted from its planned program to reduce tariff rates in general.

Box 21 - Reduction in Tariffs and Taxes on Agricultural Inputs

Advantages

Lower tariffs or taxes on key agricultural inputs encourage more efficient allocation of inputs, leading to higher industry output and social profitability.

Lower tariff levels indirectly increase the competitiveness of export-oriented industries such as the tree crops sub-sector, leading to higher industry and social profitability.

Disadvantages

There is at present limited scope for further reduction in tariffs or taxes from existing low levels and bearing in mind the recent introduction of a value - added tax.

Few direct gains from lower input prices would accrue to smallholders.

Implementing Agencies

National government – Provincial governments

Rating

Potential impact: low to high
Efficiency: high
Equity: low to medium
Practicality: medium
Risk of adverse economic outcome: low.

The need for studies of gender relations

A persuasive case can be made for more government research into ways of improving gender relations to raise productivity in the tree crops sub-sector, as demonstrated by the arguments in Box 22. The national government and industry organisations have a major funding role, but probably a fairly limited active involvement in studies. The bulk of the work is likely to be carried out by non-government organisations, including universities.

Box 22 - Improving Gender Relations

Advantages	Disadvantages
<p>Tree crop industries have been, and will continue to be, at the cutting edge of the commercialisation of agriculture in Papua New Guinea. This commercialisation process can be advanced by improved gender relations, but it can also cause deteriorations in these relations.</p> <p>A better understanding of factors influencing differences in productivity between males and females working in tree crop industries would enable more effective use of labour in production.</p> <p>Research and extension services can be made more effective by identifying the different needs of male and female labour.</p> <p>The welfare of women can be improved in both their cash cropping and other productive activities, and marketing activities. This should lead to broader rural welfare gains.</p> <p>Any gains will be felt predominantly in smallholder households.</p>	<p>Research to identify intra-household factors causing unequal bargaining power and variations in the productivity of male and female labour is difficult to undertake and intrusive.</p> <p>Resistance might be encountered to the research activities, and to any subsequent policy reform.</p>

Implementing Agencies

National government – Non-government organisations – Research and extension institutes of industry boards/corporations

Rating

Potential impact:moderate
 Efficiency:high
 Equity:high
 Practicality:low to moderate
 Risk of adverse economic outcome:low.



Classifying policy priorities

The individual policy assessments are now used to identify policy priorities for the development of the tree crops sub-sector given the three development objectives of sustainable and equitable economic growth, poverty alleviation and the creation of employment opportunities.

Three categories are designated for the various policy options considered above:

- policies that are suitable for immediate implementation
- policy options that require further analysis and formulation before implementation
- policies that do not appear to be suitable for the PNG tree crops sector:

Those policies included in the first two categories are designated as being of either high or moderate priority.

Public programs in rural health and nutrition, rural education and training, and law and order are not considered in this prioritisation on the grounds that they influence the tree crop industries in only an indirect way. A full assessment of these program areas would require a broader assessment than that undertaken in this study. Nevertheless, it is reasonable to affirm that all of these programs are self-evidently beneficial to activities in the tree crops sub-sector. Continuation of public support for them should be a high priority, at least from the narrow viewpoint of the tree crops sub-sector. The only caveat is that the challenges facing policy makers in their endeavours in these areas are formidable, especially in rural areas.

Similarly, specific attention is not paid below to macroeconomic policy. Again, sound fiscal and monetary policies are essential to the success of the structural adjustment program and the development of industries in the traded goods sector such as those in the tree crops sub-sector.

Policies suitable for immediate implementation

High priority

I. Maintenance and rehabilitation of rural infrastructure

Few quantified results are available from empirical work on the impact of improvements in infrastructure investment and services on industry profitability. But a substantial body of qualitative evidence in Papua New Guinea and other developing countries recommends a high priority to this area of policy making. Substantial gains are likely to be made in the following areas:

- new infrastructure that reduces marketing margins and raises producer prices, thereby increasing the profitability of existing production of tree crops
- new infrastructure that overcomes the remoteness from markets of many smallholders that restricts their ability to produce tree crops, or opens up of new areas to tree crop production
- maintenance and rehabilitation of existing infrastructure to improve prices to producers in areas formerly with at least reasonably good market access that has since deteriorated.

Maintenance and rehabilitation of rural infrastructure offer more immediate benefits at the margin than new investments in infrastructure under prevailing conditions in Papua New Guinea. They possess most of the advantages with few of the disadvantages of the latter, and should be accorded very high priority. Considerable potential exists to reduce marketing costs, and any supernormal profits of marketers by encouraging greater competition, thereby raising farm-gate prices. Benefits extend well beyond tree crop industries, leading to greater general rural well-being. Government intervention is unlikely to distort market prices.

Maintenance and rehabilitation of rural infrastructure should contribute significantly to the achievement of all three development objectives as well as having considerable equity benefits. Improved equity is likely because greatest benefits are likely to flow to more remote producers, who tend to be among the poorer members of the rural sector. Also, it is possible to target specific disadvantaged groups.



Implementation would be the responsibility of the national, provincial and local governments. Industry organisations and the estate sector could also play a significant role in aiding the formulation of an integrated road transport plan in specific tree crop areas. The main risk lies with an apparently chronic inability of government at all levels to ensure sufficient funds are allocated, and appropriately used, for expenditure to operate, maintain and rehabilitate rural infrastructure. Therefore, consideration should be given to the use of recently developed innovative approaches to finance operation and maintenance activities, such as dedicated road funds managed by independent road boards made up of user representatives. Greater involvement of local communities should also be sought and encouraged.

2. Public funding of tree crops research and extension

A strong public good component was identified in tree crops research and extension work, with potentially large external and secondary benefits to the rest of the economy, especially in rural areas. Some evidence exists of high social rates of return to investment in tree crops research in Papua New Guinea.

Research and extension in tree crop industries should contribute significantly to all three development objectives and, specifically, to poverty reduction. Because it creates both private and social benefits, work should be co-funded by the tree crop industries and the national government. For co-funding, a one-for-one kina contribution scheme involving each industry and the government would be a good starting point. Problems in obtaining industry funds during industry recessions could be overcome by formalising an ad hoc approach in the past whereby a progressive levy is imposed that leads to higher collections in prosperous periods and lower collections in depressed periods.

Moderate priority

1. Rural freight subsidies

Freight subsidies offer a relatively cheap short-term alternative to the construction and maintenance of rural infrastructure as a way to improve tree crops performance in rural areas, especially more remote areas. They can be particularly beneficial where a lack of public funds and resources causes long delays in the development of rural infrastructure. Their impacts should be positive for all three development objectives, and the justification of subsidies depends to a large extent on social grounds.

A policy of providing freight subsidies should be viewed as a temporary measure rather than an alternative to infrastructural improvement in the long term. Potential exists for them to introduce distortions in land use patterns. But distortions are unlikely to be great, nor to persist in the long run, if there are few profitable alternative forms of land use to the production of tree crops and the subsidies are linked to a program of improvement of rural infrastructure.

Implementation would be a national government responsibility.

2. Counter-cyclical provision of public consumption goods in rural areas

Significant improvements could be achieved in rural welfare by increasing funds for public consumption of education and health services in rural areas when tree crop industries are depressed. Such an action would not distort market signals in these industries. If implemented, targeted expenditure could help those groups of tree crop producers most vulnerable to eroding their human capital stock in times of financial difficulty.

Implementation would mainly be a national government responsibility, with assistance from provincial governments.



Policy options that require for further analysis and formulation before implementation

High priority

I. Research and extension programs

As described above, investment in tree crops research and extension is an essential part of any set of strategies to develop tree crop industries. It has positive impacts on the adoption of improved technologies that bring about shifts in both supply functions (productivity gains) and demand functions (product quality improvements). Because their impacts on these underlying supply and demand functions are lasting, they do not introduce any significant market distortions.

The high costs of research and development, uncertainties of outcome of individual research and extension endeavours, and the fact that their activities typically take a long time to yield results suggest the need for careful scrutiny of each investment before implementation. Not all research projects can be expected to be worthwhile. Hence the exclusion of this policy area from among those considered suitable for immediate implementation. Poor selection of research and extension programs means that the benefits can be quickly eroded, especially if work is not directed towards meeting the needs of smallholders. There is therefore a strong case for closer collaboration between industry research institutes, NARI and provincial extension services undertaking farming systems research and development in tree crops once satisfactory funding arrangements are in place.

An array of policy options that lead to technical improvements is available to policy makers. It covers the introduction of improved technologies that improve the yields and labour productivity of existing tree crops, the introduction of improved tree crop varieties and reduction in technical inefficiency.

A higher level of adoption of existing technologies and reductions in technical inefficiency are two cost-effective means of increasing the economic surplus of a tree crop industry. Their main advantage is the relatively low level of investment needed to derive the potential benefits. Rehabilitation of existing coffee trees was shown to be a risk-efficient activity that is capable of having a substantial impact on industry profitability. Yet the level of smallholder activity in this respect remains at a low level.

Evidence of substantial technical inefficiencies in smallholder coffee and cocoa production shows there is considerable scope for extension work to move farmers closer to 'best-practice' operations. This should enable producers to expand output without the need to resort to greater use of factor inputs or improved technologies. A number of factors were identified as influences on the technical inefficiency of smallholder coffee production that provide a focus for policy reform. Most notable among these variables are incentives to women, female labour constraints, education and initiatives to reduce hidden unemployment among household members.

2. Farm-level diversification

This initiative would be linked to research activities. Past and current success of farm-based strategies for diversification have been achieved largely at the expense of better farm performance through the adoption of improved technologies. The criteria for a successful policy of farm-level diversification that encompasses improved farming practices are to enable farmers to reduce risks while increasing net incomes. Evidence suggests this should be possible through diversification, notably intercropping, although the extent of gains would not be uniform between tree crop industries. At least for coffee and cocoa producers, considerable gains should be forthcoming from successful research-based diversification with effective extension. The policy objective most likely to be accomplished is an increase in the incomes of smallholders who produce tree crops, while keeping the risks they face at manageable levels. But the contributions by these smallholders to economic development should also be significantly enhanced.

The same provisos made above for research and extension programs in general suggest a need to scrutinise carefully each investment before implementation. This scrutiny is needed for three main reasons. First, some of the recent and current research activities on diversification of tree crops-based farming systems in Papua New Guinea have been inadequately planned and implemented. Second, the introduced diversification crop has to fit successfully into the existing farming system, requiring careful research work. Third, past experiences show that crops introduced as part of a diversification strategy in tree crops-based farming systems have not been suitable in their own right, for a variety of reasons but especially marketing ones.

As with research and extension programs, responsibility for implementation rests with industry research institutes, NARI and provincial extension services.



3. Improved facilities for rural saving

The main policy objective of this initiative is to keep the risks faced by smallholders at manageable levels. But the contributions by these smallholders to economic development should also be enhanced. Improved facilities and services for rural saving offer a powerful means to improve tree crop performance, especially by the resource-poor and remote producers. They do this by facilitating risk management at the farm level and encouraging the means to increase on-farm investment. It should be noted, however, that this policy initiative goes against a recent trend of declining financial and other services being provided in rural areas. This trend indicates that there are substantial practical impediments to implementation. Furthermore, the development of a financial system takes time, so instant results providing tree crop smallholders with greater incentives to save should not be expected.

Responsibility for implementation rests with the national government, working with commercial financial institutions and non-government organisations where appropriate.

4. Investment in rural infrastructure

The construction of rural infrastructure is an essential but not sufficient part of any strategy for rural development. It will continue to play a major role in the development of the tree crops sub-sector; through its impacts on incentives brought about by shifts in supply and demand functions at different levels in the input and output marketing systems. Because its impact on these underlying supply and demand functions is lasting, it does not introduce any significant market distortions. Instead, it alters market signals in a positive direction. Investment in rural infrastructure should contribute significantly to the achievement of all policy objectives.

The high cost of infrastructure and the fact that it takes a long time to build up an adequate base mean that its substantial benefits can be quickly eroded if it is not maintained and fully utilised for productive purposes. The national government should therefore ensure a long-term program is in place that is adequately resourced and funded in a sustainable manner, in cooperation with provincial and local government bodies. This should remain an area of importance for international funding agencies.

5 Improving gender relations

Evidence suggests there is considerable potential to enhance the role of women in the production of tree crops, with substantial external benefits to rural areas as a whole. This can be achieved by offering better monetary incentives, lifting constraints on women's time during the main harvesting season, bringing about more even bargaining power between men and women, exploiting women's commitment to tree crop production and by better and more carefully targeted agricultural planning and research activities. Apart from contributing to higher farm incomes and economic growth in rural areas, there are potentially large equity gains to be made from improving the welfare of rural women.

Responsibility for implementation rests initially with the industry boards and corporations to seek external funds to support research studies. National government support in funding research activities is also warranted given the likely significant social benefits that could flow from study findings. Research work would almost certainly involve non-government organisations that can provide specialist skills in gender analysis.

6. Land tenure reform

Land tenure reform is the most difficult policy on which to make a reasoned assessment of the policy options. The stakes are very high, and outcomes are highly uncertain and potentially explosive. There could be large efficiency gains, but equity losses might also be substantial. The political feasibility of introducing a meaningful reform that satisfies rural people is low at present.

Nevertheless, careful examination of the current situation and identification of possible areas of progress could lead to higher land productivity in the long term without jeopardising the social benefits that flow from the current system. Therefore, the national government needs to persist with incremental efforts to make land more amenable to the long-term development of tree crops. Two initiatives fit this approach: better identification and recording of land boundaries, and providing the legislation necessary to register group land and the leasing of group land to commercial interests.



Moderate priority

1. Counter-cyclical planting and maintenance subsidies

Some modest gains in performance in tree crop industries could be achieved by the use of planting and maintenance subsidies as a supplementary measure; at least, it is a policy worth considering. The success of such a scheme depends very much on the ability of its implementers and managers to get an accurate measure of trends in plantings, which is no mean feat (especially in the copra industry). There would also be some dangers of distorting market signals if prices do not recover at the predicted time. If implemented, specific and targeted subsidies would need to be worked out to suit the needs of each tree crop industry.

Modest contributions could be expected to the policy objectives of increasing the incomes of smallholders and their contributions to economic development in rural areas. The policy should also help to maintain rural employment in periods of economic recession.

Responsibility for implementation rests with the industry boards and corporations. But government financial support is justified because some external and secondary benefits would accrue to rural inhabitants.

2. Participation in risk markets

Participation in risk markets, and hedging in futures markets in particular, is a potentially valuable supplementary risk management tool for industry participants seeking to reduce the downside risk of export price fluctuations. The main obstacle to smallholders lies in the difficulties they are likely to encounter when engaging in futures market operations while trying to keep transaction costs low. However, they could benefit from the hedging activities of exporters. Until now, market-based risk management activities has been impractical in Papua New Guinea. However, international initiatives to develop new approaches to manage vulnerability to fluctuations in commodity prices offer hope for the future. The key to the success of these initiatives lies in their ability to incorporate smallholders in the benefits of risk management activities. If other deficiencies, such as institutional failure, exist in the economy that give rise to risk and uncertainty, they need to be made an integral part of a policy to reduce risk at its source.

Responsibility for implementation rests with the national government, which could usefully facilitate hedging operations that benefit smallholders. But the government should refrain from direct participation on behalf of producers. Improved options for managing market price risks could become available by participation in the current activities of the International Task Force on Commodity Risk Management in Developing Countries.

3. Improving product quality

Improvements in the quality of tree crop products offer a variety of cost-effective means to increase export prices. Gains from these price increases are likely to be distributed among all participants in an industry. A 'watching brief' to assess the scope for product quality improvement should be a component of any set of programs to improve performance in the tree crops sub-sector.

Modest contributions can be expected to all policy objectives. However, the implementation of any program or project that improves product quality does not automatically lead to higher export prices: careful economic scrutiny is needed for all initiatives. The scope for taking beneficial action is probably limited, and likely to vary between industries.

Responsibility for the assessment of initiatives within each industry would rest with the industry board or corporation. Within each industry, an integrated approach would be required to achieve maximum gains in export prices from improved product quality, by exploiting the complementarities among a number of individual approaches. This entails coordination of regulatory, research, extension and grading functions, and intervention at the appropriate levels in the production and marketing systems.



Policies that do not appear to be suitable for implementation

1. Resumption of price support in times of extended low prices

Extended periods of low export prices can have damaging effects on the long-term welfare of tree crop industries and the households of people who work in these industries. The nature of the production cycle makes economic recovery much more difficult and protracted than is the case for annual crop industries. Appropriate short-term price support offers one way to mitigate these damaging effects. The main difficulty, however, is to ensure that the support is indeed appropriate, and there are many dangers in its provision. In particular, there is the hazard of introducing macroeconomic problems and the difficulty inherent in predicting future export price movements.

The government should not commit itself to the future use of price support measures. If an extreme situation occurs that convinces the government to take action, the debt burden for such support should not be placed on industry boards and corporations, as occurred with recent price support measures. The burden of this support was eased considerably by the use of Stabex grants. But this use of Stabex funds should be treated as a one-off measure designed to allow the tree crop industries to plan for future development without the encumbrance created by debts that otherwise would have been difficult to discharge.

2. Commodity price stabilisation schemes

The advantages of price stabilisation rest mainly on improving the welfare of smallholders and aiding macroeconomic stabilisation. They have been decreasing over time while the potential disadvantages have been increasing. The benefits to smallholders are likely to be modest at best. The various pitfalls in the future operation of price stabilisation schemes make their reintroduction undesirable. Furthermore, there is a high probability that the schemes would fail when they are most needed.

Based on the available evidence on the difficulties and high costs of running commodity price stabilisation schemes, it is advisable that the national government does not consider reintroduction of any such schemes. If the industry organisations wish to do so, then it would be their own decision and responsibility. The national government should make it clear to them that it would not come to their assistance should they run out of funds. Organisations considering the use of stabilisation schemes should be encouraged to use a commodity futures market to hedge the intra-year price risks they face.

3. Further devaluation of the kina

The real effective exchange rate has had a largely positive impact on the performance of tree crop industries but the impact has not been consistent for all producers. It has mainly favoured smallholders. Devaluation can be a useful tool in encouraging increased export supply in future, but it is not an unmixed blessing as often claimed.

As strong as the influence of the exchange rate is on economic surplus in tree crop industries, the scope for its use as a policy tool in the tree crops sub-sector is now limited. The exchange rate is a key macroeconomic variable in an open economy, and its exclusive use to boost tree crop export income is undesirable to the extent that it is set out of alignment with macroeconomic fundamentals. Current macroeconomic circumstances suggest there is little foreseeable opportunity for significant devaluation of the kina. The most sensible strategy is to allow the exchange rate to fluctuate in line with its external equilibrium rate, and ensure that there is no return to a 'hard kina' policy where the kina is overvalued to the considerable detriment of the tree crops sub-sector.

4. Downstream processing

The viability of downstream processing ventures is often lacking in Papua New Guinea due to comparative and competitive disadvantages in processing. Efforts to seek out downstream processing possibilities should be left to the private sector. At most, industry boards and corporations can aid these efforts in modest ways, but ultimately the commercial decisions must be made by the private sector on a case-by-case basis.

Downstream processing of tree crop products is only going to provide more export price stability as a by-product of a major investment designed to increase the value added by an industry. Reducing price variability alone is not a reason to engage in downstream processing. This is particularly the case where reduced price uncertainty is replaced by increased market uncertainty brought about by greater non-price competition.



5. Input subsidies

Input subsidies could be useful short-term measures to raise productivity if they are carefully targeted for short periods to correct for under-utilisation of certain production inputs, notably those used for plant protection. But their impact on smallholders is likely to be minimal, and they are prone to cause distortions in resource use that lead to losses in industry welfare. In addition, they can be politically difficult to remove. On the evidence provided in this study, it is inadvisable for the national government to subsidise purchased inputs (primarily fertilisers and chemicals) in tree crop production.

6. Reductions in tariffs and taxes on tree crop inputs

The limited scope for reducing value-added taxes and tariffs on inputs used in tree crop production does not make this option very important at present. There is, however, one circumstance when its importance could become greater. If value-added taxes were to be introduced at the provincial level, they could have serious effects on tree crop industries were the levels of such taxes to be high. The costs of imposition of provincial taxes would be mostly borne by estates if they were to be placed on inputs.

7. Crop insurance

Crop insurance offers little prospect for managing risk in tree crop industries in Papua New Guinea. The scope for gains is extremely limited given the major obstacles to the creation of the facilities needed to offer meaningful insurance at affordable premiums.

8. Subsidised interest rates on rural credit

The subsidisation of interest rates on loans to tree crop producers should not be considered as a permanent arrangement. At best, it could be introduced as a specific short-term measure aimed at encouraging desired behaviour by producers that results in higher productivity. Even then, there are better and more easily targeted measures to achieve the same outcome. It is preferable to subsidise the availability of rural financial services than interest rates, as this does not militate against rural saving.

9. Minimum rural wages

On the surface, it seems that wages policy could play a major role in influencing profitability in the tree crops sub-sector. The economic surpluses of all industries in the tree crops sub-sector are highly sensitive to the opportunity cost of labour. Despite this influence, the scope for using this variable as a policy tool in the tree crops sub-sector is limited. Given the current wages policy in Papua New Guinea, there is little that can be recommended to improve the fortunes of the tree crop industries. There is no role for the government to play where the opportunity cost of labour varies with market forces.

There is little purpose in a return to the setting of a rural or urban minimum wage. Any reversal of the current wages policy back to one in which minimum wage levels were set would raise the cost of labour in tree crop production. If the levels were to be rigorously implemented, their only impacts on the tree crops sub-sector would be to reduce industry profitability and rural employment.

10. Product promotion

Gains to smallholders from generic promotion of tree crop exports would be negligible. Promotional efforts are only likely to yield dividends if they are combined with product differentiation strategies associated with niche exports. Promotion campaigns are easier and more likely to be effective among producers of high-quality exports, who tend to operate in the estate sector.



Conclusions

Future role of tree crops in the economy

The tree crops sub-sector in Papua New Guinea has travelled along a rocky path since the commodity boom of the mid-1980s. At times, when circumstances and prognostications were particularly bleak, observers, government officials and advisers were casting doubt on the leading role of the sub-sector in agricultural, rural and general economic development. Even today doubts persist about its future role, particularly in the light of the sluggish growth in its contributions to national income and pessimistic forecasts about future world price trends. The case for gloomy market forecasts, however, is far from proven. In fact, it is doubtful whether anyone can predict long-term world commodity price trends with any degree of accuracy. The best stance is to assume that current prices, which are neither very high nor very low, are a reasonable approximation of the future. It is the stance that has been taken in this study.

Despite a dramatic transformation of the economy in Papua New Guinea in recent decades, it still relies heavily on its agricultural sector. It depends on the tree crop industries, in particular, with their predominant position in the traded goods sector. This sector is the linchpin of economic reform measures under the current structural adjustment program. Also, the social consequences for rural areas of a rapidly decaying tree crops sub-sector are seen by many as too appalling to contemplate (although this view probably underestimates the resilience and flexibility of smallholders). Hence, the case for an important future role for the sub-sector remains strong. But this case is subject to the strong proviso that its industries remain competitive in their international markets and the nation retains a comparative advantage in the production and export of tree crops.

Recent measures of competitive and comparative advantage reviewed in this study suggest that Papua New Guinea has a comparative advantage in the continued production by smallholders of all of the four major tree crops. Also, three of the smallholder industries (coffee, cocoa and oil palm) are competitive in their international markets, while the copra industry is marginal at current world prices and exchange rates. A strong case can be made to continue to support coconut production as an integral part of the cocoa and coconut-based farming system.

Policy options for improving the tree crops industries

The tree crops sub-sector is therefore considered to be crucial for economic development in general, and smallholder agriculture in particular. Its revitalisation, by improving its ability to remain profitable and internationally competitive, is a planning priority and it is deserving of continued government assistance.

A variety of policies with direct impacts on the tree crops sub-sector were considered in this study, with emphasis on their impacts on smallholders. A group of these policies were identified to be suitable for immediate implementation, and a second group were identified as needing further analysis and formulation. In addition, three general policy areas with indirect implications for the welfare of people in the tree crops sub-sector were accorded a high priority. They are rural education and training, rural health and nutrition, and law and order.

The following tree crop policies were identified as suitable immediate implementation. Those accorded the highest priority are seen as vital to the long-term economic welfare of tree crop smallholders:

- maintenance and rehabilitation of rural infrastructure
- public funding of tree crops research and extension.

Policies accorded the next highest level of priority for immediate implementation are:

- rural freight subsidies
- counter-cyclical provision of public consumption goods in rural areas.

A second group of policy areas accorded a high priority, also viewed as vital to the long-term economic welfare of tree crop smallholders. However, it is concluded here that they should be implemented with question — after rigorous analysis and formulation procedures are applied to individual projects and programs. They include:

- research and extension programs and projects, especially those that raise the yield capacity of existing trees and palms and contribute to the knowledge base on sustainable tree crops-based production systems



- farm-level diversification initiatives that enable smallholders better to achieve the dual goals of reducing risk and increasing net farm incomes
- programs to improve rural financial facilities, especially for saving
- investments in rural infrastructure that assist the more remote farmers and open up new productive lands for tree crop production
- research programs to study and improve gender relations in households producing tree crops
- incremental land reform measures that make land more amenable to the long-term development of tree crops without detracting from the benefits of the existing land tenure system
- initiatives to encourage industry participation in risk markets.

Policies accorded moderate priority for further analysis and formulation include counter-cyclical planting and maintenance subsidies, and support for private initiatives to improve product quality. Short-term price support in times of extended low prices should be applied only as a last resort, with very strict guidelines and for a limited time horizon.