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FOREWORD

The papers contained in this volume constitute the Proceedings of the Policy and Strategy Conference on Reforming and Restructuring the Agriculture Sector at Local Level, held in Lae from 7-8 August 2000.

The PNG Journal of Agriculture, Forestry and Fisheries took the initiative to publish the Proceedings of this important workshop which is likely to determine the future directions of Agricultural Development in Papua New Guinea. Earlier a similar publication by the Journal in 1994 on Agricultural Reforms and Delivery of Farming Services to PNG Villages was very well received.

As pointed out by the editorial staff, it must be admitted that in view of the variety of subjects discussed ranging from extension at village level to research at the frontiers of science, it was not possible to exercise uniformity in scientific standards and presentation. Attempt has however, been made to bring into focus the current issues facing agriculture in PNG. These issues need to be discussed and debated by all concerned rather than becoming a part of the grey literature.

I would like to express our thanks to the authors for their contributions, Professor R. Kumar and Mr Siva Supiramaniam for editorial work at short notice, Ms Betty Aiga for design and layout and Mr Jackson Kaumana for cover design.

MIRI SETAE
Secretary, DAL

SPEECH BY THE PRIME MINISTER, RT. HONOURABLE SIR MEKERE MORAUTA, KT., MP. AT THE OPENING OF POLICY & STRATEGY 2000 & THE 17TH NATIONAL AGRICULTURE COUNCIL CONFERENCE, LAE, 07 AUGUST 2000

The Rt. Honourable, Sir Mekere Morauta[1], Kt., MP.

The late Fred Fisk, a notable economist, once described Papua New Guinea's traditional life as 'affluent'. The basis of that affluence was subsistence agriculture.

Papua New Guinea is a nation of gardeners and farmers. Food crops have been grown here for at least 7,000 years. In fact inhabitants of our land have been living off agriculture for longer than almost any other area in the world. Agriculture is the heart of our country. It is also our future.

But in recent years, particularly in the original 1999 Skate Budget, Papua New Guinea's heart was cut out. It was surgery at its crudest, and nearly resulted in the death of the patient. It was surgery without the services of a qualified anaesthetist. Considering the importance of agriculture to the nation's economy, this was an act of unprecedented stupidity. A classic example of short sightedness.

Until the opening of the Bougainville copper mine, agriculture completely dominated the economy and Papua New Guinea's exports. About one-third of gross domestic product is still provided by agriculture, forestry and fisheries. Last year, just over 29 percent of the nation's export income came from the sector.

I might add, while I am here in Lae again, that the farmers of Morobe Province have reason to be proud of their economic role: this province is one of the powerhouses of the agriculture sector.

The previous Government planned to kill off Papua New Guinea's agricultural research capacity, but fortunately did not get round to the act of legislative execution.

So when we were elected in July last year, we found that the patient still had a pulse. Because we had been left with a ruined economy and government finances that were notable for their absence, we could do little but put these critical research institutions on a drip feed.

The combination of industry levies, past savings, a small amount of Government money and AusAID help for the National Agricultural Research Institute (NARI) gave the industry a reprive until the 2000 Budget.

This increased the Department of Agriculture and Livestock's recurrent allocation by almost 20 percent to 9.5 million Kina. In addition, aid money under the Public Investment Program provided about two-thirds of the total agriculture budget.

Stabex funding from the European Union has in 2000 played a vital role. The Government has approved a number of Stabex schemes aimed at improving research and extension services. For example the Coffee Industry Corporation is receiving about 4.5 million Kina for promotion and research, including a taste-improvement project.

NARI, the country's premier research body, will receive 2.5 million Kina for the establishment of its headquarters and laboratories at Bubia, outside Lae.

The Fresh Produce Development Company is receiving 2.5 million Kina from Stabex to upgrade depots in the Highlands, Lae and Port Moresby

[1] Prime Minister of Papua New Guinea.

and for support for refrigerated containers from the Highlands.

1 million Kina has been allocated to improve National Capital District mini-markets. If further EU funds become available, and the Government strongly encourages the EU to continue its funding for agriculture, this project will be extended across the country.

The Livestock Development Corporation is receiving 3 million Kina to develop a cashew project in the Central Province.

The Government's biggest commitment of Stabex funds is to agriculture on Bougainville, in total 17 million Kina. Three million Kina of this is going to port and other transport infrastructure and production and distribution of new planting material. The remainder is linked to Aus/AID and UNDP programs, including access roads and cocoa support. The Government is playing its part, within its means.

Recurrent allocations in the national Budget to research and marketing institutions rose from zero in 1999 to 3.7 million Kina in the 2000 Budget. Most importantly, NARI received a recurrent allocation of 1.9 million Kina, against nothing in 1999.

These were small increases, and nowhere near enough to restore agriculture to its rightful place.

In the forthcoming Budget, there will be further increases, in recognition of the critical role these institutions can play in increasing national wealth and personal well-being, especially in rural areas.

Again, the increases will not be massive, but they will be carefully targeted to try to ensure that they have the maximum impact.

One emphasis will be on **crop rehabilitation**. Coffee, cocoa and copra will each receive a major injection of funds next year, specifically for rehabilitation.

The need for rehabilitation of our export crops is plainly evident. Cash crop production and export revenue have not been growing anywhere near as fast as all the experts say they could, given the undoubted potential of the country.

Proper, sustained and well-funded research and extension services can help to overcome many of the problems that afflict cash crop production. Planting material is a good example. Nothing demonstrates that better than the success of the oil palm industry. New Britain Palm Oil and others in the sector are world leaders in research, and the foundations of much of that research rest on the work done when NBPO was a state-owned business. The planting material used by the industry is without doubt world-class.

Much of the material that has been available for coffee, copra an cocoa growers in recent years has been of a much lower standard. It has severely inhibited the growth of these industries. Now, new material is becoming available through domestic research institutions.

The Coffee Research Institute has made available a new dwarf variety called Catimor, which is high-yielding and also grows in previously marginal areas in the middle altitudes. It has successfully been tried in areas such as the Bainings in East New Britain and in Milne Bay. The institute has also developed better crop management and new pruning methods to increase the yields of existing varieties.

For copra, no new suitable planting material has been available for years. A new hybrid is now being developed by the Cocoa Coconut Research Institute (CCRI) at Madang. Hopefully, it will have beneficial results.

A similar situation exists for cocoa. In the 1980s the CCRI undertook a poorly planned and run cocoa plant breeding program, which set the industry's develpment back by many years, with poor material being planted, and industry debt increasing by tens of millions of kina. Now the CCRI and the Cocoa-Coconut Extension Agency are offering new planting material.

The Government is committed to the rehabilitation of export crops, particularly through wide distribution of quality planting material. Industry bodies will be asked to recommend the best ways of allocating the funds for this initiative.

We have begun initial talks with the Asian Development Bank for loan funding specifically for improving research and extension services. The main beneficiaries would be NARI and the individual industry institutes.

Last week there was a valuable planning consultation session with the Australian Centre for International Agricultural Research concerning a five year collaborative program between Australian and PNG institutions. This would involve the agriculture, fisheries and forestry sectors. These programs have proved successful in the past and will be more so in the future once Papua New Guinea has revitalised its own research bodies.

Two other areas will demonstrate the Government's renewed commitment to agriculture: an extension of the **tax credit scheme** to the agriculture sector and a greater emphasis on **collaborative research** with the private sector.

The tax credit scheme has, by and large, worked successfully in the resources sector. The Government is prepared to extend it to agriculture. The Bogan Tax Review is currently considering the cost implications of such a scheme, and how it might practically be applied to support the development, but particularly the maintenance, of essential rural infrastructure. Certain services, including agriculture extension and research, might also be eligible activities to be funded by the scheme.

Agriculture stands to gain a great deal from research undertaken by the private sector and national institutions together. Collaborative research overseas has been immensely rewarding, not just for the companies concerned but also for the partner institutions and scientists and for farmers. There are many areas of agricultural research that would be beneficial both to the nation and to commercial partners.

There is little point in having successful crops if they cannot be taken to market and sold for a price that is above the cost of production yet affordable to the average buyer. The level of imported fruit and vegetables in our shops highlights the lack of coordinated action for the development of the sector.

It has been demonstrated that we can grow almost anything in the country, yet our long-term successes have been few and far between. The reason is poor marketing, and another is high cost. Cost is a severe inhibiting factor at both ends of the process: input and out. To overcome this primarily means having an efficient transport infrastructure system.

Infrastructure development and maintenance, along with primary industries, health, education, revenue generation and law and order, are the Government's six priorities. These were the only areas to receive additional funds in the 2000 Budget and I expect a similar pattern in 2001. These have received sixty-five percent of the Government's total expenditure this year. The economic and infrastructure sectors received 10.5 percent of the total expenditure.

I know only too well that this is not enough, and I am committed to increasing it in the 2001 and 2002 Budgets. But it is not just money that will revitalise agriculture. Our approach, our thinking, our priorities in the sector need to change. Sound development of agriculture requires that **farming** be given the status and support it deserves. Not administrative bodies, nor state marketing bodies, nor public servants, but farming, planting old and new crops: real-life agricultural activities must be our focus.

Regulatory and marketing functions should be clearly separated, with oportunities for genuine competition encouraged in the interests of producers. Trading monopolies by public or private bodies should be discouraged, thus reducing opportunities for abuse. Accordingly, the Government will review the system and structure of marketing copra. Marketing should not in my view be a state function. Regulation, however, should.

As part of the public sector reform programme the Department of Agriculture and Livestock and other institutions in the sector will be examined to ensure excessive drafting, institutional hierarchies and overheads are pruned. The programme will ensure that the focus is genuinely on supporting producer interests, or supporting effective provincial and district-based extension services.

For years the provinces and other industry bodies have perceived that the Department as virtually irrelevant, or even as a handicap or bottleneck. Its new role requires a markedly leaner but more professional service body, entailing the transfer of technical staff to Districts and industry bodies, while securing relevant economic, marketing and information technology skills.

Various structures are possible, involving different links across the renewable resources sector, but the support structure for the sector must be practical, affordable, and be responsible and responsive to farmers. We simply cannot afford a great institutional superstructure that fails to deliver support services.

It is clear that in recent years farmers have secured better services from corporatised and privatised industry bodies. Opportunities to outsource activities will be pursued.

That this can be successful is demonstrated here in Morobe Province and the Eastern Highlands under the new extension project being funded by the Asian Development Bank.

Ladies and gentlemen, over the last year the Government has necessarily been preoccupied with the programme of economic, monetary and budget stabilisation. Our objectives have, on the whole, been achieved. The groundwork has been laid for real economic growth and development.

On the budget, from the savings generated from reduction of our debt service burden and from refocusing government activities, supported by the funds now flowing from the World Bank, the IMF and donor countries will, from next year, allow us to invest more in agriculture and infrastructure. The improved investment climate should also encourage much greater private investment in agriculture.

These factors combine to provide us with a chance to give our most important sector a new life line. We cannot afford to let the opportunity pass by. What an achievement it would be if, in years to come, economists were to describe our modern agriculture as the basis of a truly affluent society.

PLANNING FOR NATIONAL ECONOMIC GROWTH THROUGH AGRICULTURE

Honourable Moi Avei[1,2], MP

Welcoming comments: My Prime Minister, the Hon. Sir Mekere Morauta, MP; fellow Ministers; the Governor for Morobe Province, the Hon. Songang Luther Wenge, MP; Chairman, Mr Miri Setae; and distinguished guests.

Mr Chairman,

Over the next 2 days, and on this most important topic, a range of speakers will provide detailed comment on what they believe to be the most effective direct policy measures for assisting Papua New Guinea's agricultural sector. On behalf of the Minister for National Planning and Implementation, the Hon. Moi Avei, I will restrict my comments to the wider policy environment and explain how the Government's approach to planning at the national level will impact on agricultural activity throughout the country.

Agriculture in Papua New Guinea is of such fundamental importance that it is unquestionably our most important industry. As we all know, agriculture supports 85 percent of the population, or around 4 million Papua New Guineans, and in 1999 it generated over K1 billion in export income. More importantly, it is the sector with vast potential for development; potential that has been largely neglected by successive governements.

For many decades to come, agriculture will continue to be the economic mainstay for the vast majority of Papua New Guineans. In relation to national planning, we should never lose sight of this fundamental fact. Policy and planning which encourages robust growth in the agricultural sector will be far more meaningful to the welfare of the majority of Papua New Guineans than, say, the commissioning of new mining or petroleum projects. It is also a fact that even if wage employment in PNG's formal sector were to double over the next 5 years, such growth would nonetheless still be inadequate to absorb the projected increase in PNG's economically active population. Even under such a scenario, around 100,000 Papua New Guineans would still need to secure their livelihood in the agricultural sector.

So when we talk about National Economic Growth through Agriculture, we must recognise at the outset that for the vast majority of Papua New Guineans - past, present and future - agricultural growth is economic growth, and the bridge to improved living standards.

Papua New Guinea has a rich and proud heritage as an agricultural society. We are a nation of farmers. For thousands and thousands of years our ancestors developed sustainable and productive systems of agriculture that comfortably met subsistence requirements. With subsistence requirements for food and shelter readily achieved, ample time was available to develop the rich culture that we, the current generation, are rightly proud of. Indeed, the first visiting social scientists to Papua New Guinea coined the phrase 'subsistence affluence' to describe our traditional systems of economic and cultural activity.

In reflecting on our past, we should nonetheless guard against being too romantic. As we enter the new millennium we must also acknowledge that, taken in isolation, our traditional agricultural systems do not deliver the living standards that Papua New Guineans legitimately aspire to in

[1] The Minister for National Planning and Implementation, Papua New Guinea.

[2] Presented by Honourable Bart Philemon, Minister for Transport and Civil Aviation, Papua New Guinea.

today's modern world. By today's international standards, measured by indicators of calorie intake, literacy levels, infant mortality and so forth, we must acknowledge that there is a growing level of poverty within our 'subsistence affluence' society.

As well, in certain parts of the country, population pressures are placing considerable strain on our traditional subsistence safety net. Moreover, and as was shockingly demonstrated during the 1997 drought, our traditional subsistence agricultural systems leave many Papua New Gineans vulnerable to the worst form of poverty, that is the absolute poverty associated with severe and life threatening hunger.

In planning for agricultural growth, it is important to define the role of government in the development process. In this regard, we need to learn from our past mistakes and build on our past successes. One of the most important lessons of the previous 25 years is that government should not attempt to address the problems of poverty or stagnation simply by embarking on an expensive program of "hand-outs". Handouts are neither affordable nor appropriate. They are also an insult to our rich history of self-reliance.

Rather, the Government's principal role in economic development is to create the environment that will enable Papua New Guineans to mobilise their own resources and energies in order to achieve increasing living standards. The Government's role is to 'help-out' rather than 'hand-out'.

As was emphasised at the recent conference on food security, what we want to achieve is a stronger and more diversified food crop and livestock sector. The traditional garden should continue to protect rural Papua New Guineans from absolute poverty. Importantly, however, we need to build on the traditional garden and provide all rural Papua New Guineans with the opportunity to use their agricultural skills as the means of entry into the cash economy. Trading agricultural surpluses in the market economy will allow families to satisfy more than their basic needs, and permit them to move to a higher standard of living. Cash incomes from agricultural surpluses will enable families to purchase clothing, shelter, medicines, educational supplies, household items, garden tools, and the foodstuffs required to achieve a more balanced diet.

Moreover, as was clearly demonstrated during the 1997 drought, the saved income from cash crops is also one of the best forms of food security. Cash savings were used by affected communities to purchase food staples when their own gardens failed.

The Government's key planning document, the Medium Term Development Strategy (MTDS), is our road map for creating the very environment which will enable rural Papua New Guineans to achieve rising standards of living through a more productive agricultural sector. In order to create this environment, the MTDS emphasises the need for the government to focus on basic education, primary health care, infrastructure maintenance, law and order and on increasing the opportunities for the private sector. These priority activities - the pillars of development - are also reflected in the National Charter on Reconstruction and Development, which was signed by the Prime Minister and Provincial Governors in November last year.

Government programs in these priority sectors are mutually supporting:

- **Basic education** and **primary health** care are not only fundamental for human development they are absolutely necessary to allow Papua New Guineans to generate agricultural surpluses and to participate effectively in the cash economy.

- **Infrastructure** such as roads and wharves is essesntial to allow those in the rural sector to market their agricultural produce. As was noted in the MTDS, given good roads, agriculture could link 570,000 rural households in Papua New Guinea with the rest of the world, providing markets for the entire surplus they

produce. Adequate infrastructure is also necessary for the flow of health and education services, and to allow access to material goods and services. Good roads are roads that are readily passable in all weather conditions. As has been recognised in the many conferences and seminars of recent times, good roads in Papua New Guinea are the exception rather than the norm. I will, of course, discuss this issue in more detail, when I address you as Minister for Transport and Civil Aviation. However, I should just say that from a national planning perspective, the maintenance of the existing road network will be the priority of the Morauta government. The rehabilitation of our road network will provide enormous benefits to our agriculture sector.

- **Law and order** is fundamental to private sector activity. Personal and property safety are essential to enable Papua New Guineans to safely go about their business in the rural economy, both as producers and consumers.

- In relation to policies aimed at directly **increasing opportunities in the private sector,** there is a clear need to revitalise agricultural research and extension and to strengthen farmer-training programs. Research and extension, and improved training, will provide the foundation for increased yields and the adoption of higher valued crops.

Reflecting the poor state of the PNG economy that the Morauta government inherited, the 2000 national budget was, by necessity, very constrained. Nonetheless, the budget managed to allocate around 65 percent of total expenditure to the priority areas. As well, under the government's guidelines for the administration of the K89 million District Development Program, the expenditure of monies will be in-line with the key priorities, including aid posts, teacher housing and rural feeder roads.

As has been emphasised by the Prime Minister, the 2001 budget will continue the responsible approach to economic management. First, it will consolidate the hard-won macroeconomic gains by ensuring the continued stability of the kina and by paving the way for further falls in interest rates and inflation. Second, it will seek to continue the shift of resources to the priority areas and activities.

While primary health and education, infrastructure maintenance and law and order will continue to be the priorities of the government, we are also committed to examining all policies and options that directly target an increase in agricultural activity. In this context, I look forward to the ideas and views that will be put forward at this seminar. The Minister for Planning has assured me that all these options will be carefully examined and appraised, along with the recommendations put forward at the conference on food security.

The recommendations arising from this and other conferences will play a very important role in defining the focus and shape of future development budgets and public investment programs. Aside from the priority activities identified in the MTDS, the Government is committed to implementing specific programs and policies where it can be demonstrated that they will deliver a significant and ongoing improvement in the welfare of Papua New Guineans as a whole.

As we enter the new millennium, the agricultural sector will remain a principal focus of our planning policies. This is where the vast majority of Papua New Guineans live their day-today lives. We must strengthen the policies and programs that benefit our rural majority. We must create the environment that will allow them to achieve the living standards they so richly deserve.

AGRICULTURE TRADE

Honourable Michael Nali[1], MP.

INTRODUCTION

I am honored and thankful to the Deputy Prime Minister, Hon. Mao Zeming for inviting me to speak on the topic "**Agriculture Trade**" at this Conference on "**Agriculture in the New Millennium**".

What is Trade?

First of all, let us remind ourselves that "Trade" remains the building block of an economy's growth potential and wealth creation. Without both domestic and international trade, there will be no market outlets to reward the costs incurred in the production of goods and services.

In other words, there will be no incentive to produce goods and services to realize the growth potential. At the end of the day, we have to trade the surplus we produce in order to re-finance our production.

"Agriculture Trade", therefore is vital to act as a catalyst for economic activity in that sector. If you cannot sell your produce then why invest resource to tend the land and grow crops of different types. Hence, an economy cannot do without trade.

TRADE AND TRADE POLICY DEVELOPMENT

Agriculture Trade

Various empirical studies show that agricultural products account for over one third of export trade for most developing countries and will continue to contribute significantly to their GDP, foreign exchange earnings, employment and food security for a long while.

This is also true from PNG's perspective where, **"Agriculture Trade"** represented K 1.02 billion in 1998, with a corresponding market share of 27.5% of the total exports for the same year. It will continue to represent an average of 25% of GDP that includes Forestry and Fisheries, while accounting for the bulk of the employment.

According to the recent World Bank Study, the Agriculture Sector is one of the sectors where PNG has comparative advantage over its neighbours. The main traditional cash crops such as coffee, cocoa, copra & palm oil provides over 12% of the total export earnings.

The narrow base of the economy is anticipated to continue. At the same time, agricultural exports as a share of the total export value has declined on a downward trend over the years, while other sectors have fared an upward trend.

Among the noted reasons for this decline were:

- erratic and enclave sectoral economic growth;
- low human capital and labour productivity
- high cost structure of the economy and
- negative effective rates of protection in the renewable resources industries in agriculture as a result of higher tariffs on transportation, equipment, fuel and other inputs.

Further, some of the notable factors constraining the agriculture sector:

- difficult topography
- debt overhang in the sector
- land tenure problems

[1] The Minister for Trade and Industry, Papua New Guinea.

- poor infrastructure
- poor business support services, and
- small and isolated markets

Against this scenario, the National Investment Policy recognizes that there is considerable growth potential in agriculture sector. There is opportunity to make this sector more competitive for its traditonal exports with FDI and specific initiatives for private sector promotions and financial sector reforms. That is, efficient mobilisation and credit allocation for productive activities.

Rationale of PNG Trade Policy Development

It is within this underlying principle of trade and the importance of agriculture trade, that I would like to focus on the strategic direction taken by the Ministry of Trade and Industry under the 1992 **"Beyond the Minerals Boom"** Policy Document, which encompasses the Trade policy development of PNG to the year 2000.

Unfortunately, most of the targets set were not achieved, partly due to resource constraints and socio-economic and political instability during that period.

In essence, the '**Trade Policy**' at that time was targeted at all levels. It ranged from the inward looking - often referred to as import substitution to that of '**outward looking-or export oriented**' with equal emphasis on diversification from traditional products into new areas or products as dictated by the changes in the global market.

It was simply to facilitate the notion of not putting all the eggs into one basket. It was a sound policy within PNG's context, despite criticisms on the in-ward aspects of trade promotion.

From June, 1996 when PNG joined the World Trade Organisation (WTO), it was obliged to review the trade and investment policies and relevant regulative instruments, which were promoting import-substitution. As you are fully aware, the non-tariff barriers such as import bans quotas and licensing were abolished in favour of protective tariffs. The protective tariffs were to be gradually reduced over time towards the bound rates.

As a member of WTO and APEC, PNG has committed itself to reap the benefits of a multilateral open trading system, through greater market efficiencies and thereby was required to liberalize its market through the maintenance of an acceptable level of tariff bound rates for both agriculture and industrial products.

In the schedule of commitments therefore, PNG has bounded the agricultural goods at 40% and the industrial goods at 30%.

By setting the bound rates at 40% for agricultural products, this would allow reasonable time frame for a gradual reduction of high protective rates for some of the existing products to acceptable tariff levels. At the same time, any tariff measures for a new range of agricultural products will not exceed the bound rate of 40%.

On the whole, the bound rates are within the requirements of WTO, where developed countries are required to reduce the average tariff on agricultural products by 36% over six years while developing counties by 24% over a ten year period.

Global Perspective of trade

Let me reiterate the brief details of the Trade related Agricultural Policy Developments with in the Global Environment as it will dictate the terms in which we are to facilitate trade.

The Uruguay Agreement represents a milestone in the multilateral trading system. For the first time, agriculture has been incorporated under operationally effective rules and disciplines. Market access and disciplines on domestic support and export subsidies in agriculture, forestry and fisheries have been improved under the Uruguay Round commitments.

Yet improved conditions of competition an op-

portunities for trade in agricultural products depend on the commitments regarding market access.

The Agreement on Agriculture (AoA) is of great significance, as it has brought agriculture into the mainstream of international trade rules. The three main provisions of the Agreement are aimed at:

- improving market access;
- reducing domestic support; and
- reducing export subsidies.

The Uruguay Agreement therefore provides a window of opportunities for all countries to benefit from greater access to world markets by curbing past production-and trade-distorting practices and by facilitating more competitive and fairer trade.

National Perspective of Trade

In becoming a member of the World Trade Organization (WTO), Papua New Guinea made commitments in its Protocol of Accession or Schedule of Commitment on trade liberalization, including trade in agriculture, within given specified timeframes. As a signatory to the Agreements, PNG assumes the obligation of complying with their provisions.

Being a member of the Food and Agriculture Organisation (FAO) of the United Nations, PNG is also required to comply with its obligations under FAO.

One of the requirements of the WTO is that member countries must ensure complete compliance and conformity of their trade policies, regulations and practices with the rules of the Multilateral Trading System. Policy reforms in the three main areas of the AoA - improving market access, reducing domestic support and reducing export subsidies towards complete trade liberalization on the basis of non-discriminatory trade practices (MFN and National Treatment principles) among all member countries is non-negotiable. That is a legal requirement to effect trade liberlization to facilitate fairer trade between trading partners.

Papua New Guinea has opted for the policy of gradual liberalization under its APEC/WTO commitments and is expected to fully liberalize trade by 2020.

TRADE POLICY ISSUES

- Importing countries are starting to insist that imported produce meet Codex Alimentarius recommendations for quality;

- Importing countries are also starting to insist that imported produce comply with their sanitary and phytosanitary standards in conformity with the General Agreement on Trade & Tariff;

- Supermarkets in Japan, America and Europe are imposing quality standards higher than national standards;

- Pacific Island Countries (PIC) are beginning to recognize that inter-regional trade in agriculture produce among and between Pacific nations is possible;

- Pacific regional meetings are an on-going process to address these issues of trade in horticultural products. Recommendations from past meetings highlighted the recognition by PICs that significant technical support will be needed by exporting countries, if they are to meet the challenges of the new liberalized environment;

- PICs are now mobilizing and consolidating regional support and resources to confront the trade liberalization challenges and to take advantage of benefits of free trade. Issues of discussion are;

- Competitiveness of domestic products against imports;

- Diversifying marketability of products, and

market access - issues taken up for discussion at WTO meetings by PICs who are WTO members (current membership: PNG, Fiji and Solomon Islands. Vanuatu is in the process of accession).

- Positions of the Major Players.

- National and Regional responses to the Major Issues.

Development of Agriculture

The National Government has among other policies and strategies, approved the Small and Medium Enterprise (SME) Policy (1998) and National Investment Policy (Vol. 1 & 2) (1998 and 1999 respectively).

These policies broadly provide the framework for improved business entironment and increased investment in the small holder agricultural activities, as well as medium and large investments. The SME Policy calls for actions to be taken to:

- improve and increase market access;

- improve and increase access to development finance;

- improve and increase Human Resource Development;

- improve and increase infrastructure;

- improve and increase information quality and availability; and

- improve and increase technology input.

Complementing this call is the National Investment Policy, which is intended to improve business environment, in terms of policy, practice and legislation for investment as well as enabling environment, in terms of Business Incentives to promote investment and business growth.

CONCLUSIONS/RECOMMENDATIONS

In conclusion, I must state that PNG should analyse market trends, market needs/demands, challenges and opportunities and decide on its market strategies, if benefits are to be realised.

In terms of **Policy Reforms** we should give priority, to progressing effort from "vulnerability" to capability, and concentrate on areas where we have comparative advantage. At the same time we should develop strategies based on realistic and achievable goals.

Papua New Guinea's strategy should be to place emphasis on developing PNG's international competitiveness in the production of goods and services, including to agricultural products.

Given the expected increases in the cost of production in many countries which are experiencing higher standard of living, PNG is placed to compete well in the production of most agricultural goods in terms of quantity, quality and price.

It is therefore part of the Ministry of Trade and Industry's responsibilities to negotiate market access for the traditional and new export crops if there is unfair market restrictions.

On the other hand, market preferences into regional markets such as European Union and other similar arrangements will erode. This means that all the producing countries have to develop their competitiveness in both the cost and quality aspects to meet the market's specific requirements, such as standards, quarantine and health regulations.

With this humble presentation, I wish this conference every success and thank you.

TRANSPORT - KEY TO AGRICULTURE DEVELOPMENT

Honourable Bart Philimon[1], MP.

The Prime Minister, Sir Mekere Morauta; the deputy Frime Minister and Minister for Agriculture, Horourable Mao Zeming; Colleague Ministers; Departmental Heads; Distinguished Guests; Ladies and Gentlemen.

I have been invited to speak here today on the subject 'Transport - A key to Agriculture Development.

Over the last 25 years we have shown that we are only good at talking but very poor in delivering what we preach about. Whilst we keep on talking there remains a very large unfinished agenda of development. Right before us is an insurmountable chalenge for each policy makers and implementors to once and for all to stop the empty rhetorics year in and out and lets get on with the job of real tangible development. Dare I say that we are the only one believing in our own rhetorics. We can be assured that the general public have stopped listening to us until they see government delivering real tangible development and not empty development rhetorics.

Let us be frank with one another. If we continue as we are, there is a great possibility that transport will fail each of our expectation, as a key to agriculture development.

Let me highlight some facts which the Minister for Works and I have continuously mentioned in our official statements. The current RAM study estimates the annual requirements for routine and periodic maintenance of the national road network to be between K70 - K90 million, with a further K30 - K80 million for specific maintenance, rehabilitation and reconstruction. For the next five years, the budgetary requirement for the national road network to bring it up to acceptable level for usage is estimated to amount to K170 million annually.

By comparison, the funds actually allocated over the two years proceeding 1999 totalled only about K17 million a year. In 1999, K70 million was allocated but only K38 million was drawn for road maintenance, an amount still well short of the identified requirements. For the year 2000 only K20 million has been budgeted.

Maintenance of the National road network has consistently fallen behind requirements. Throughout 1990s successive governments have been unable to adequately fund road maintenance activities. Over the ten years 1990 - 1999 the funds made available for maintaining national roads average only 32% of the estimated requirements compared with the average requirement estimated to be K8,700 per kilometre. As against K2,700 per kilometre over the last ten years.

This is the sad tale on the national road network of which there is about 7,400 kilometres. But that is the small portion of our development effort. The bulk of the road development in the country is expected to be carried over to the provincial and district responsibilities under the reform. At present it is estimated that 16,500 kilometres of these roads are the responsibilities of either the provincial government or the district government. There are no accurate data readily available on expenditure by provincial administrations for the maintenance of these roads, however, you can be sure that the situation is worse than the national roads.

As a result of past neglect, about a third or more of the national road network is judged to be in a bad to very bad condition, and two third or more of the provincial roads are unpassable for parts of the year. Vehicle operating costs are significantly higher than they should. As a conse-

[1] The Miniser for Transport & Civil Aviation, Papua New Guinea.

quence prices are higher which impact directly on prices of goods and services. These associated costs are clearly visible in agriculture sectors and related industries.

There is an urgent need to restore the condition of our road network to a stable and maintainable state. This will involve extensive upgrading and rehabilitation over the next 5 - 10 years at least. Some donors supported projects are under way and others are planned to help in this process. Their ultimate success will depend on the country's ability to fund road maintenance on a sustainable basis and to strengthen management of the tasks involved.

Almost every sector of the economy has identified infrstructure in general and specifically transport infrastructure as a major factor holding up development. For the private sector and the economy to flourish and investment to grow, the government policy has to seriously focus on maintaining and upgrading transport infrastructure. The importance of properly maintained transport infrastructure cannot be over - emphasised. Properly maintained transport infrastructure will assist in only only reducing the cost of doing business, but more importantly in restoring growth in the economy and access to social services for the majority of our people. The generally poor quality and limited development of the national road infrastructure network imposes significant constraints on the development of the local transport industry and thereby economic growth.

The most obvious impact of poorly maintained roads is a substantial increase in the cost of road transport. Rates of fuel, oil and tyre consumption and the vehicle depreciation on rough roads are significantly higher than on well maintained pavements. In addition limits imposed by weak pavements and bridges require the use of smaller, less economical vehicles and hampered the introduction of more efficient, modern trucks.

This trade off between road maintenance expenditure and the vehicle operating costs is being examined by a road cost recovery improvement technical advice project funded by the Asian Development Bank.

There is a recognition in government that alternative funding sources, other than relying on annual budget appropriations need to be developed and adopted. The only realistic alternative approach is require road users themselves to contribute to the cost of maintenance, either fully or partially, directly or indirectly. Official government policy supports this principle of road maintenance cost recovery from road users. The policy has been enunciated for several years and periodically is reaffirmed. The most recent statement was made in my ministerial statement to parliament last month and is contained in the draft national transport infrastructure development plan. The plan's propoal for reform includes:

a. The institution of a policy of recovering all necessary routine and periodical maintenance costs for highways, and

b. The principle that road user fees and charges (the taxes and charges imposed on road users) should reflect as closely and as practically the extent of road use and road damage caused by different class of vehicles.

This policy will require strict adherence in the operation of a system of road users charges. An examination of this policy is currently under way to establish together with institutional mechanism required to ensure the transparent and effective management of the funds generated, and their guaranteed use on road maintenance programmes.

The agriculture sector must now consider in its policy options how the producers of agriculture products will have to deal with the user pays policy.

The link between agriculture and the mode of transport as a vehicle to mobilise agriculture commodities to increase productivity and efficiency is strong and must be encouraged. The two sectors must develop detail analysis of the

links and work towards achieving a common focus. A common focus would help the two sectors to depend on each other for their survival by developing this formulae the two agencies I believe will be able to recover costs from their investments.

The transport ministry will be launching its policy soon and it is important for me to highlight some of the major aspects of the policy with the hope that you in turn may want to dovetail all your policies to take advantage of development in the transport sector.

The objective of the policies will be basically to provide access for all people, something which cannot be easily achieved overnight. Encourage national identity and cohesiveness, improve transport safety and assist economic and social security and development. In short, the government will emphasise on the most populated areas and the most economically oriented areas. Expensive as they are, we need to raise the necessary funds through cooperation with our private enterprise partners, through privatising our transport institutions where possible and create an environment which encourages competition and enterprise. We must not pretend, we need to move towards the principle of 'user pays' to recover the costs of transport operations while acknowledging the vital role that transport plays in development of our national economy.

Specifically the agriculture sector must now consider in its policy options how the producers of agriculture products will have to deal with the user pays policy. Should the policy of subsidy be recognised it should only be approved for improving participation in the economy by Papua New Guinea nationals, and for stimulating persons living in remote areas to participate in the market economy.

AGRICULTURE AND THE BOUGAINVILLE PEACE PROCESS

The Rt. Honourable Sir Michael T. Somare[1], GCMG., CH., MP.

Honourable Mao Zeming, Deputy Prime Minister and Minister for Agriculture and Livestock; Senior officials and distinguished guests; ladies and gentlemen.

Village-based agriculture is the main source of food and cash incomes in Bougainville, as it is in other rural areas in Papua New Guinea.

Farmers and agricultural officers in Bougainville face many of the same challenges as their counterparts in the rest of the country. But certain challenges are unique to Bougainville. Some result from the eight years of death, destruction and general distruption which occurred during the period of violent conflict from 1989 until the **Burnham Truce** was signed in October 1997. Others are integral to peace-building and the prevention of further conflict.

So let me begin by outlining the effects that the conflict has had on Agriculture in Bougainville. I shall then suggest how the agricultural sector can contribute to lasting peace by peaceful means.

I shall show what is required - and what is being done - in other economic sectors and government activities, including foreign aid, for agriculture to succeed.

My conclusion is the same as the policy - objective I believe must be pursued. Government at every level, the private sector and the community must all work together to ensure that sustainable agriculture helps to ensure self-sustaining peace.

EFFECTS OF THE CONFLICT

While public attention has tended to concentrate on mining at Panguna, the reality is that agriculture has always been the backbone of the economy as far as most people in Bougainville have been concerned.

Agriculture fed and provided cash incomes for people in rural areas. It provided more people with productive employment. If properly managed, agriculture, unlike mining, has always been potentially sustainable in the long run. As in other parts of Papua New Guinea, people have had regular access to adequate quantities of a variety of nutritious foods.

Before armed conflict broke out in 1989, Bougainville was - by far - the largest cocoa - producing province in Papua New Guinea accounting for over 40% of national cocoa exports, and about 2% of global production.

Cocoa not only contributed to the macro-economy but - with **75 per cent** of total production coming from Papua New Guinean smallholders - it did so in ways which were consistent with such national goals as equity and participation.

Home to some of the largest commercial coconut plantations in the South Pacific, Bougainville was also a major copra-producer. Again, smallholders played a very significant part. Village-based cocoa and copra production was generally additional to subsistence agriculture. Vegetables and fruit were sold at urban markets in Buka and Arawa.

Locally-produced meat came from hunting, village pigs, and chicken projects. Fish were a further important source of protein. Most Bougainvilleans not only had enough to eat but were able to earn a small cash income. Their lifestyle was typical of what is widely described as 'Subsistence Affluence'.

[1] The Minister for Mining and Bougainville Affairs, Papua New Guinea.

As the crisis spread and intensified from 1988-89, pubic infrastructure, homes and gardens were damaged, destroyed-or left to decay. Cash-cropping was increasingly disrupted. Many villagers eventually abandoned their homes, tree-crops ard food-gardens and fled to care centres.

For the frst - and, one hopes, the last - time, food security became a widespread concern. Commercial plantations were left to themselves. A number of them were eventually taken over by customary claimants. In either event, they tended to be neglected and production went down; and exports virtually ceased.

An entire generation of young people have since grown up with little or no experience of gardening for food or cash-cropping, and almost no formal education or training. Access to the rich variety of foods previously available has declined. So have cash incomes.

As peace has consolidated since late 1997, most villagers have returned to their homes, and begun working in their food-gardens again. Village plantations are being cleaned up. Seedlings, including new hybrids, are being sown.

Though cocoa and copra production are only small fractions of what they were before, they have been rising - and are still going up. Where people have - or can borrow - sufficient funds, cocoa fermentaries and copra driers are being repairec, or built.

The result is that village-based agriculture is gradually recovering, both subsistence production and cash-cropping. New crops - including rice for subsistence - are being planted and harvested. But most large commercial plantations continue to suffer neglect - awaiting decisions or their future. The reality is that a great deal more work still needs to be done before pre-conflict levels of subsistence and income return.

AGRICULTURE AND PEACE

Both the **Lincoln** and **Ceasefire Agreements** recognise the diverse range of issues they address to provide a framework for a comprehensive and integrated approach to building peace. Neither agreement refers specifically to agriculture. But agriculture is clearly integral to restoration and development - making it possible for people to return to their homes, to support themselves, and to begin improving the quality of their lives.

Agriculture can also contribute to peace-building in other ways. They range from the obvious - such as producing food for traditional reconciliation ceremonies - to subtly providing former fighters, youths and their communities with alternatives and incentives which give them a direct stake in peace.

Rehabilitation and further development of agriculture can, therefore, facilitate weapons disposal, re-establishment of civil authority, and other changes required to bring about an early return to normalcy.

But resources must be adequate. They should be carefully targeted. As Minister for Bougainville Affairs, I must, therefore, point out that responsibility for agriculture in Bougainville is not mine - and not the national government's - alone. Success in the agricultural sector will require active participation by business, and support from the community as a whole.

They currently carry them out in consultation with leaders and groups who do not want to come under the **Organic Law** - through an agreement between the interim provincial government and the Bougainville people's congress.

Unfortunately, Francis Ona and the hard-core of his closest supporters are not party to the agreement, or to the Peace Process as a whole - though we continue to invite them to join in.

The Governor is preparing to hold a public forum to discuss priorities for planning in Bougainville. His proposal has my full support. The sooner we obtain detailed information on community needs and priorities, the earlier we can try to secure

resources from the National Budget and Foreign Aid Donors - and the faster we can get on with the job.

An agreed Mechanism for co-ordinating the planning and implementation of major restoration and development activities, including efforts by Foreign Aid Donors, would be another desirable outcome.

The challenge we face is not simply to grow or acquire - and then distribute - seeds or technical information, but to provide the agricultural sector with the other supports it needs.

We must also make sure that every effort is made to prevent further conflict by learning from - and avoiding - past mistakes.

They include failure to ensure equity, as well as adequate opportunities for Bougainvillean participation.

SUPPORT FOR AGRICULTURAL RECOVERY AND DEVELOPMENT

The Cocoa and Coconut Extension Agency is currently working on an ambitious rehabilitation project involving the planting of more than 9 million cocoa and 100,000 coconut trees. In addition to the National Government, the project receives substantial financial and technical support from a number of Foreign Aid Donors.

They include the European Union, AUSAID and the United National Development Programme. Total cost is expected to be K6.2 million over two years. The same project will also assist in the rehabilitaton of cocoa fermentaries and copra driers. The budget is expected to be K3.8 million.

But recovery - and further development - of the Agricultural Sector after a major conflict involves more than pruning and replanting, or repairing production equipment. It requires many other supports.

In an administration which has not been able to operate properly for more than ten years, building capacity and strengthening institutions must be urgent priorties. Financial and other forms of accountability must be improved, and made fully effective.

When almost entire generation in some parts of Bougainville has missed out on school, let alone specialist training, simply recruiting and training qualified people will not be enough. Fresh opportunities must not be allowed to reinforce past inequities or divisions.

A substantial catch-up component is, therefore, essential - focusing on areas, communities and individuals who have missed out. I am pleased to say that Bougainville leaders have recognised the need - and indicated that they will support an appropriate project.

Given the lead-times which planning, aid programmes and, especially, education involved, it is vital that arrangements for such a project are finalised without delay. Other supports for agricultural recovery and further development must receive equally urgent attention.

They include provision of adequate training for potential farmers, many of whom have not been able to gain even quite basic skills. In addition to lack of experience in planting and caring for crops, the difficulties which must be addressed and overcome include widespread inability to read extension materials, ignorance of bookkeeping, and the absence of basic industrial skills.

The adverse economic effects the Bougainville crisis has had on many local communities mean that potential farmers will, almost certainly, need access to small loans. But, firstly, the commercial banks which hold deposits from Bougainvillean customers must do more to release funds in accounts which became dormant during the crisis.

They should make themselves more readily accessible for the purpose (for example, by sending representatives to tour Bougainville). The

same applies to funds held in deceased customers' accounts. They should be released to the rightful heirs without further unnecessary delay.

As Minister for Bougainville Affairs, I am determined to increase the funds available for small loans for Bougainvilleans who need assistance in rehabiltating, establishing or developing village plantations.

I encourage Foreign Aid Donors such as AUSAID, the European Union and UNDP to expand or develop similar schemes. A related option, which should soon be considered at cabinet level, concerns the possible acquisition and redistribution of large commercial plantations.

In addition to equipping and supporting farmers directly, the rehabilitation and further development or cash-cropping in Bougainville will require repair, reconstruction and upgrading of infrastructure damaged, destroyed, or left to decay during the conflict. Needs include roads, bridges and wharves.

AUSAID is currently funding work on the main trunk road between North and South. The project provides additional support for the Peace Process by subcontracting to Bougainvillean firms and groups, including former fighters.

The European Union has taken responsibility for feeder roads. Where produce can be moved to the coast the wharf at Kieta is now being used by ships engaged in export trade (Buka is the other operational export wharf).

Buying-points for cocoa and copra are functioning at Buka, Wakunai, Loloho, Kieta, Kangu and Mamagota. A Papua New Guinean company, AGMARK, has been licensed to export cocoa from Bougainville to overseas. Thus, much of the infrastructure required to export agricultural products from Bougainville is now in use, or will soon be ready.

The agricultural sector is well-placed to contribute to further consolidating peace. The main question is when other aspects of the Peace Process will be ready to do the same.

As I have already said, recovery and further development of agriculture can provide support for such varied aspects of the Peace Process as weapons disposal, re-establishment of civil authority, as well as restoration and development generally. But the reverse is also true.

Farmers and agricultural officers require peace, order and the rule of law in order to work or do business, especially when it comes to moving produce to market. The joint policing project with Australia and New Zealand is making good progress in recruiting and training Bougainvillean auxiliary police.

Consistent with the priority that the Government has given to strengthening the integrity of State Institutions and stabilishing the budget we have to make sure that graduates from the project are given regular employment and pay.

They must be supported by appropriate equipment, infrastructure (including housing and offices), as well as other key elements of the justice system, such as courts and correctional institutions.

It follows from the comprehensive and integrated approach to Peace-Building outlined in the **Lincoln** and **Ceasefire Agreements**, that people who work in the agricultural and other sectors must feel safe. It is, therefore, vital that arms must be removed from the community - and civil authority must be strengthened - without further delay.

The government has already made clear how concerned we are at the continuing failure to finalise practical arrangements for weapons disposal, despite the concessions we have made. Instead of moving ahead on an issue which goes to the heart of mutual confidence-building, we continue to be met with further conditions and delays.

The effect of such tactics is not only to hold up weapons disposal but to cast doubt on the com-

mitment that certain parties - or, at least, their spokespersons on the peace process consultative committee - have for the peace process as a whole.

It is hard to see how far a progressive political settlement can proceed without agreement, at least, on a detailed plan for removing guns from the community. It is even more difficult to imagine how free and democratic elections can be held until after the guns have been put out of reach permanently.

CONCLUSION

The aim of my statement has been to highlight that agriculture in Bougainville faces not only the same challenges as in other parts of Papua New Guinea but some that are unusual, even unique.

Just as peace-building requires a comprehensive and integrated approach, so recovery and further development in the agricultural sector depend on other supports.

Like every other area of government activity, agriculture is on the agenda for the next round of political talks - not specifically, but by virtue of the powers and functions which the combined Bougainville delegation has proposed for an autonomous Bougainville government.

In early July, my ministry convened an executive workshop at which more than 100 heads and senior officials from almost all government agencies considered the Bougainville leaders' proposals.

As Minister for Bougainville Affairs, I am obviously keen to see the National Agriculture Council take note of the points I have made in this statement about the particular needs of agriculture in Bougainville, including the supports required from other areas of government activity, Foreign Aid Donors and the community as a whole.

I should also like to see the neutral, regional peace monitoring group keep supporting the Peace Process in new and creative ways - for example, by ensuring that further reductions in numbers and increased contracting-out are accompanied by procurement of locally-produced food.

Finally - and, in many ways, most pressingly and importantly - let me invite you all to think through the implications of the Bougainville proposal that all government responsibilities in agriculture should gradually and ultimately be transferred to an autonomous Bougainville government.

On the other hand, I would like to alert you to the issues being discussed in the Bougainville political talks.

On the other hand, I invite you to make your views known - about the extent of any transfer, and the scientific, technical or legal safeguards which the national interest might require.

As officials and advisers of the National Government and combined Bougainville delegations are due to meet again on 28 August - and leaders a few days later - I should welcome your early advice.

Thank you.

SUSTAINABLE AGRICULTURAL CREDIT

Beno Boeha[1]

INTRODUCTION

This morning we were reminded again of the importance of Policy and Strategies in Agriculture. The Prime Minister refreshed our memories as to what agriculture should be. And further, the Acting Minister for National Planning and Monitoring, Hon. Bart Philemon reminded us that we should always plan for economic growth through agriculture. It is imperative to remember that, if we are going to plan for provincial and district levels of economic development, then agriculture must be part and parcel of our development policy and strategies at those levels. If we have acquired financial and technical resources from donors, then we need to ensure that they are properly utilised in the areas of most needed, such as health, education, infrastructure, fisheries, forestry, and agriculture.

EXPENDITURE PLANNING

My task this afternoon is to present my views regarding the Agricultural Incentives through Sustainable Agricultural Credit. However, I would like to begin by reiterating that every government must have its expenditure planning based on an annual three-year rolling exercise under the National Public Expenditure Plan (NPEP). This policy must be adopted as a tool to ensure that growth in expenditure is directed towards activities which the government has designated as having priority in the National Development Strategy (NDS), as was alluded to earlier this morning.

Many of you are undoubtedly well aware of the aims of the NPEP to link the planning process with the macro-economic policies and the budget, direct public expenditure towards activities that have national priority in the implementation of the NDS, and monitor the implementation of the projects. The current Government has reaffirmed that sustaining agriculture is one of its priorities.

SUSTAINABLE AGRICULTURAL CREDIT

Just what is Sustainable Agricultural Credit? To be able to give an accurate anwer to this question, we need to know what is supposed to be sustainable. Are we referring to the **agriculture** or the **credit**? This issue is important and very serious, not flippant. I am assuming that it is the **agricultural credit** that is to be sustainable. But is it to be **environmentally, socially**, or **economically** sustainable?

Environmentally Sustainable

Ecological Sustainability is not an issue that should be addressed through credit. This should occur in the design of agricultural projects. Nevertheless, any lender who is supporting a large agricultural project should check on the environmental impacts of the project to ensure that these have been addressed in the project design. If this has not occurred, it may eventually render a project non-viable, by raising costs or making it liable for compensation payments.

Socially Sustainable

To be **socially sustainable** any loan must be for a productive marketing purpose, and not for personal consumpton. Loans should enable levels of production that would not otherwise be possible.

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Economically Sustainable

To be **economically sustainable**, credit must be subject to the recipient's capacity to repay. Therefore, a loan repayment plan must be bsed on cash flow budgeting of income and expenses. However, this is a frequent problem, particularly where the borrower's education is lacking, and the onus is placed on the lender to be responsible in not overburdening the client.

Often, such agricultural credit needs to be on longer terms than in other business. For example, tree crops can take several years to reach full yield potential. A problem in Papua New Guinea is that the interest rates on loans are far too high for ordinary citizens to afford. The present interest rate climate is not conducive to borrowing for any business, including agriculture and rural development. So where do we go from here?

NEXT STEP

There are several things that the Government and its policy makers may wish to consider.

Rural Development Bank (RDB)

The Rural Development Bank (RDB) is the major player among the rural financial institutions in PNG. The public and private commercial banks and other non-banking financial institutions follow its leads and policies. The RDB must undergo changes to ensure that it becomes an effective organisation in its own right. Otherwise, it will fail to achieve its prime objectives and is bound to face a natural death, in due course.

Two objectives are paramount in achieving sustainability of financing, particularly in the rural areas:

- reaching financial self-sustainability; and
- sustaining outreach to the target rural population.

Financial Sustainability

The long-term financial viability of the RDB, and other financial institutions, which provide funds through such agricultural credit schemes, depends largely on each institution's efficiency, productivity, and support by appropriate policies. They must show that they will be **cost-effective** in the short term, and **profitable** in the long term. This means that the credit management policy must made to support the long-term financial sustainability.

Privatisation of the Rural Developmet Bank

Generally, the performance of state and donor-sponsored rural financial operations have fallen short of expectations, and many credit programs have become liabilities to the government's finances. On the other hand, it would be interesting to determine whether the profit-driven private sector is interested in taking over the business of **development banking**. It is worth noting that even in capital rich economies, the private sector is usually not very interested in venturing into this area. In a market economy such as that of PNG, any profitable and viable business will be voluntarily set up by the private sector, without State intervention.

Previous Credit Program

In the past, some trusts were established by either provincial governments or foundations such as the Lik Lik Dinau Abitorea (LLDAT), the UNDP assisted Trust Fund in Gorcka, similar one in Bougainville, and several others. However, their impact has not been assessed for some, but not others. Cooperative banking has not worked in PNG, but there should be new ideas and initiatives to establish such institutions as a "Farmers' Bank", "micro financing" or rual financial systems for rural agricultural populous.

The reasons that previous programs have not worked are because of:

- a shortage of resources and poor recovery; and

- rural downturn in, and lack of, support services, including extension of markets. I will touch on the latter in my paper later this week.

Resource Mobilisation

Rural and agricultural financial institutions may depend on resources that are mobilished through savings, soft loans from donor agencies, market borrowings, retained profits, or government budgetary support. In the past, multilateral funding agencies used to provide soft loans. However, they are no longer interested in such arrangements, because of the failure of the bank to reduce costs and improve recovery.

NEED FOR CAREFUL EVALUATION

The following issues must be properly identified and addressed before venturing further with new ideas and models for agricultural financing, including the idea of establishing a "Farmers' Bank" or "micro financing".

Financial Policies

The prerequisites for any successful agricultural and rural-based financial system are the implementation of apropriate financial policy reforms concerning:

- interest rate;
- credit decisions, based on financial return;
- term nature on lending;
- resource mobilisation policy;
- accounting for bad debts;
- expenditure control, based on costing studies; and
- cost recovery, including service charges.

Before consideration is given to the adoption of any credit finance program, these policies **must** be in place.

Institutional Policies

Financial institutions must have a cost-effective structure and management system in place in order to meet the challenges, and ensure that the venture is financially viable.

The financial and economic viability regarding institutional cost-effectiveness, and a reasonable return on investment in order to have funds for future loans, must be established.

Viability of Credit Operation

In order to avoid current constraints in this area, the viability of any credit operations at an affordable and commercially profitable interest rate for the thousands of smallholder farmers within PNG is the crux of the problem. This must be properly evaluated and resolved before embarking on any new financial ideas and systems, such as the recent micro financing.

Resources for Lending

Sufficient resources must be made available or mobilised for lending, for the various agricultural sector activities. If new financial or resource initiatives are going to depend on the Government, then they could easily repeat past mistakes, as occurred with the RDB.

Managerial Capacity

The tree crop industry corporations must assess their managerial capacities, if they are to take up the responsibility of financing the agricultural sector.

FINAL REMARKS

If we are to attain any form of sustainable agricultural credit, it will also depend on the attainment of macro-economic, and political stability in the country. Such necessary achievements will ring interest rates down, and allow credit to begin to play a major part in rural development. In turn, this will enble concessional loans to be sought, wherever possible.

AGRICULTURE POLICY AND STRATEGIES FOR ECONOMIC GROWTH

Kino C. Wenge[1] and William R. Gwaiseuk[2]

INTRODUCTION

Agriculture including fisheries and forestry being renewable sectors will continue to make long term contribution to the development of PNG and its people. The issues for agriculture must be considered beyond technical horizons and biases to embrace a wider vision of encompassing both local and export market. The dominance of the sector is evident in terms of food production, foreign exchange earnings, income generation, creating market for industrial sector and continued employment opportunities for the bulk of the population.

In PNG under 20% of the population live in and around urban centre and development areas such as agro-forestry, agricultural land settlements, mines, gas, major roads projects, dam projects by ELCOM and satellite townships.

There is a definite trend of people migrating towards urban and within rural areas in search of social and economic opportunities. If this dangerous trend continues, by the year 2025 anything from 40-50% will live at those localities. This represents an immense challenge for food security, poverty alleviation, especially as the per capita food production and supply is decreasing and the proportion of undernourished people living in the rural areas increasing.

The apparent reaction of the increasing population is the development of intensive farming systems, based on high-valued crops, fruits and small livestock. These farming system have distinct characteristics, opportunities and interactions. They have already emerged in all the major cities, towns and mining townships, project areas and over in rural areas of PNG.

The new generation of farmers have demonstrated their ability to adopt new technologies. This has been shown by the acceptance of new crops, large scale farming practices, mechanization, irrigation and use of fertilizers and pesticides. Commercial farmers of varying sizes on communal a nd private land have emerged under the impact of favourable market prices. Due to limited resources and various constraints, rural communities are finding it more convenient to co-operate in agricultural schemes where they realize that further fragmentation of land and othe resources is not economically viable.

The government policies for agriculture is devised with the view of ensuring that agriculture remains the mainstay of the economy with adequate resource support to promote sustainable growth, and increase in rural employment. The policies recognize the limited role of the government but promote greater participation of the communities and the private sector with Government playing a catalytic role. The focus is on getting greater effectiveness in the sector through networking with stakeholders.

AGRICULTURE POLICIES

It is obvious that the agriculture sector will continue to be one of the most important sources of income and employment, and that development in this sector can empower people to sustain livelihood and reduce law and order problems. The sector's policy is to ensure the viavility of agricultural production and marketing, sustain

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growth, increase income generation opportunities and improved rural standard of living.

Four areas are given high priority and represent the key elements of PNG's agriculture development programs:

- The first is the equitable delivery of quality agricultural development services, including fisheries and forestry.

- The second is to increase food security and nutritional levels of those involved in the subsistence agriculture with limited cash crop production.

- The third is the development of the export commodities, including diversification into alternative crops in order to reduce vulnerability to price fluctuations of the traitional export tree crops.

- The fourth is the development of downstream agro-processing of agricultural crops, fisheries, timber and other resources, including cottage industries.

Goals of the Department

The Department of Agriculture as the lead agency facilitating the agricultural development has produced a "White Paper on Agriculture", which stipulates sectoral policies 1997-2001. It is currently being reviewed with industries and sectoral consultations. The DAL has pursued the following goals followed by broad policy objective and general strategies with the aim to:

- Increase the productivity and production of agricultural commodities and improve sectoral GDP contribution.

- Improve the delivery of services by restructuring of institutional arrangements including privatization and corporatization.

- Support the expansion and diversification of commodities for export and import replacement.

- Improve and expand production of food crops and livestock to enhance national food security and meet local nutritional requirements.

- Encourage people in less developed areas to participate in the cash economy.

- Improve self employment opportunities among the rural people to help minimize urban drift.

- Ensure agriculture has a broader and sustainable production base.

- Encourage the private sector to play a greater role in the agricultural development.

- Ensure highest standards of agricultural research, plant and animal health and quality of produce.

- Facilitate the development of human resources of the sector so as to meet the needs of the changing economic and social environment.

- Ensure that the agriculture development is enhanced with minimum adverse environmental effects.

General Objectives

The Government recognizes the importance of agriculture in the economy and the potential it offers to create sustainable income and employment opportunities. Agriculture is a priority sector and the allocation of available Government resources must be increased to reflect this status. Seven principles for guiding policy directives for the period, 2000 to 2010 shall be to:

- Foster more balanced development of the sector in order to generate broadly based rural income and employment, reduce rural poverty, improve food security, and promote sustainable natural resource utilization.

- Give urgent attention to alleviating more serious constraints to ensure sustainable agricultural growth.

- Concentrate efforts on investment programs with hgh economic returns in production, exports, income and employment with minimal adverse effects on the environment.

- Create environment conducive to encourage greater private commerical sector participation, especially removing macroeconomic policies that hamper agricultural growth.

- Ensure development of human resources for them to participate productively and improve general rural welfare.

- Improve the efficiency and international competitiveness of traditional export crops by raising smallholder productivity and product quality, and by lowering production and marketing costs.

- Assist farmers in using any reasonable opportunities for efficient diversification of the agricultural production base, both for import substitution and exports.

Strategic Objectives

- Maintain a macroeconomic environment and incentive regimes that do not discriminate against agricultural growth;

- Improve the effectiveness of public institutions, programs and expenditure for agriculture;

- Foster greater private sector participation in capital investments and in the provision of agricultural support services where it is economically viable;

- Promote investments that offer opportunities for new export earnings and efficient import substitution; and

- Address the deficiencies in agricultural production, support services, delivery systems, and in the physical and economic infrastructure.

- Constinue reforms to corporatize agricultural services in the major export tree crops industries for efficiency and release scarce Government resources to other sub-sectors.

- Revitalize research and extension services delivery systems through DAL reforms.

- Advance human resources development to avail more productive agricultural workers.

- Increase food production to attain food security and reduce dependence on imports.

- Diversify the agricultural production base through improved crop and livestock technologies, downstream processing, etc.

- Conduct applied research to develop technologies relevant to agricultural production systems and are environmental friendly in PNG.

- Improve the quality of animal and plant health through reforms to provide necessary research and inspection services.

- Improve incentive programs e.g. smallholder credit, transport subsidies, agricultural taxation regimes, etc.

The Public Investment Program (PIP), with commodity project approach, has been the main vehicle DAL employs in addressing some of the constraints facing agriculture. However, effective realization of these problems depends largely on the availability of funds, skilled DAL staff, farmers and other agricultural workers and the effective linkages to be established under the new Government reforms.

Current Policies

Agricultural growth is essential for economic development and being the primary sector it has to take a leading role in economic transformation. Being the most prominent sector of the economy it will continue to provide the market for industrial and service sectors.

- Intensive agriculture offers better scope in

increasing productivity and for future expansion and sustainability of the sector. Modernizing the sector will solve some of the persistent problems hindering growth in the sector.

- Crop diversification by developing alternative cash crops like spices and condiments, fruits and nuts should be encouraged to broaden sectoral production and export base.

- Improving production and productivity both traditional and introduced food crops and livestock subsectors is an important priority area for food security and as an alternative source of cash.

- Revitalization and rehabilitation of the plantation sub-sector in order to increase production, productivity, employment, income and improve livelihood of the primary producers.

- Smallholder farming incorporating improved technology and traditional farming system will remain the main focus of sectoral policy to support commercialization of the primary production, processing and marketing.

- Appropriate policy interventions are necessary to modernize and commercialize the sector in order to activate private sector participation.

- Papua New Guinea Food Security Policy approved on 24th May 2000 by National Parliament should get necessary resource support for full implementation (2000-2010).

STRATEGY FOR AGRICULTURAL DEVELOPMENT

The need to raise the profile of women

This is one of the key issues of immediate concern facing PNG as we enter the 21st Century. Despite the multifaceted tasks that our mothers perform, their works often go unrecognised, and they lack the leverage necessary to gain access to resources, training and credit. By directly empowering our womenfolk, they can have an impact on improving national food security and rural development.

Accelerating Agricultural and Rural Development

Improved infrastructure, increased economic activities in the cities and mining areas, increased plantation agriculture, more industrial developments etc, have been largely responsible for the rapid growth in national food production since independence; managing to keep pace with population growth. Despite this, chronic undernutrition persists in many rural areas. Eliminating hunger will require concerted efforts in accelerating agricultural, rural agro-forestry, health and other rural development in those areas. These developments must be built on ecological principles so that the natural resource base, biological diversity and the forests, which are the ecological base for food security, must be protected for the present, as well as their future use by our children.

Land Mobilisation

Since 98% of the rural population own land, it is absolutely imperative for programmes to mobilise rural participation through farmer organization. This will overcome land tenure problems which has detrimental affect on rural development.

Land Capability Assessment

Land capabilities assessment is a very important prequisite to a national master plan for water and land resource development including an assessment of priorities accorded to respective regions and areas within the country.

The government should encourage and facilitate the agro-ecological approach to sustained land use and land development, ensuring that any large scale land development for agriculture is based on land capability for particular land use type which is economically viable and environmentally friendly. Smallholder farm structure

and land patterns should adapt to the dual objectives of increasing food production and promote a wider distribution of benefit of agarian progress.

Water Resource Management

Water scarcity has presented itself as a critical constraint to food production. This has become quite clear during the 1997/98 **El Nino** drought. The use of appropriate technology to improve water harvesting, conservation and management for human, livestock and agricultural use could contribute to national food security, and increase the marginal value of otherwise unproductive lands.

Reforestation

Forests and trees play a crucial role in fuel wood, and indirectly they improve agricultural production, increase incomes and improve access to food. They are a veritable storehouse of biological diversity and maintain the ecological base for food security. The social and economic impacts of wholesale deforestation in the lowlands and **devegetation** of fallowed agricultural field in the highlands, and in other major project areas needs addressing. Reforestation programmes must be started in all these areas.

Aquaculture

Fish are becoming an important source of both food and income to many people in PNG. In the highland areas inland fish farming has spontaneously emerged as an economic activity. There is considerable potential to expand on aquacultural farming in order to improve food security and increase household incomes.

New Livestock

There is also considerable potential for expansion of livestock production. Livestock products contribute in a big way to household incomes. New Species and breeds of livestock such as rabbits, turkey, geese, guinea pigs, village chickens etc need to be tested.

Post Harvest Technology

After the food, the fish, and the animals are harvested, culled or slaughtered, what happens after that often determines to a large extent what price the farmer receives for his farm produce. Efficient village based processing, distribution and marketing systems can make a vital contribution to food security, national employment and improve incomes for rural families.

Furthermore, with the changing lifestyle into a dependence on cash economy, technical advances in food processing and preservation is required to process food to enter the market place and make it accesible to all at a minimum cost.

The list could go on, but the aforementioned development issues will suffice as important indicators or benchmarks that must call for a concerted effort towards developing an agricultural programme for the major project areas.

The Department of Agriculture and Livestock has revised its policy framework to foster partnership, alliance and networking in service delivery. The primary objective of the policy is to increase and diversify food production, processing, preservation and marketing in PNG in order to achieve greater self-sufficiency in food and attain higher food security at the national and household levels by the year 2010.

Legislative Review to Coordinate Sectoral Management

We are also reviewing all the legislations governing operations of sectoral agencies to bring about harmony in legislation to ensure a coordinated approach to development. The Department is already restructured and is regionally based to assist provinces and the industries that are represented here. We must deliberately enforce and enhance partnership and continue to work together on improving the extension delivery systems.

Food Security

Food Security is defined as a state of affairs where ***"all people at all times have access to safe and nutritious food in sufficient quality and quantity to maintain a healthy and active life"***

National Food security includes both adequate domestic production of food (food self-sufficiency) together with the capacity to import to cover shortfalls in domestic production to meet the needs of the population. It entails issues ranging from food production, distribution and marketing, preparation, processing and storage, to population and health, education, employment and income, roles of women, environmental concerns and sustainable resource management.

The policies bring into clear focus work programmes to enhance food production and strengthen its capacity to ensure: conservation, improvement and sustainable utilization of natural resources, including land, water, fisheries and genetic resources for food and agriculture. The policies also clearly define the roles and responsibilities of all key players to strongly enforce a multi-sectoral partnership in the conduct of the National Food Sedurity Work Program.

CHALLENGES AND CONSTRAINTS FOR FUTURE POLICIES

Major challenges facing PNG in increasing domestic food production and improving food security are decreasing/insecure world market prices for the major export crops (cocoa, coffee, rubber, plam oil), the increasing demand for food imports (cereals, beef, mutton), environmental degradation (deforestation, soil erosion) and marginalization of the rural poor. Government has identified a number of key constraints to overcoming these challenges:

- Poor transportation infrastructure system hinders market access distribution system and dissemination of new technology and market information;

- Inadequate resource allocation to the agriculture sector: the share of national government resources to the Department of Agriculture and Livestock continues to decline, from 9.3 percent of the total national budget in 1985 to approximately 2.0 percent in 1994;

- Current public service terms and conditions are not conducive to employing and retaining high quality and experienced professional staff in rural areas;

- Low productivity and production of agriculture crops, closely related to low farmer commitment. Both are results of unstable yields, low farm management skills, insecure market incomes, a lack of farm cooperations and/or co-operative, inadequate credit schemes, and social and cultural obligations, laws and, especially, land tenure arrangements.

- Unstable yields as a consequence of increasing soil erosion, declining soil fertility, increasing disease and pest pressure as results of the extreme weather conditions and landscape, the lack of agricultural inputs and appropriate machinery (for land preparation and irrigation), partly related to unavailability of credit for the majority of farmers and the low farm management skills (in economic and technological terms).

- Poor infrastructure, high production and transport costs, lack of downstream processing and market related insufficiencies.

- Lawlessness in rural areas prevents villagers from working their gardens and also increases costs particularly for plantations, buyers and processors;

- Cultural related constraints prevent the foundation of farmer co-operative, lead to fire hazards and are the major source of land disputes.

- Farmers are not homogenous, hence specific

needs analysis is required to address the issues.

- The new organic law on Provincial and Local Level Government clearly delineates roles for national, provincial and district administrations with respect to development, co-ordination and implementation of policies and programmes. For any impact to be realised, the role of local level governments must be acknowledged as these are institutions that are able to articulate grassroots demands and make inputs into national policies.

Unfortunately, the devolution of powers to the districts and local level governments under the recent reforms have not been effective and they are not able to mobilise sufficient resources to provide services to the community.

Given the key position of the agriculture sector in PNG, we need to ensure that this sector develops on a sustainable basis, which will enable it to continue providing for an increasing population; and to reduce food imports.

These objectives can only be met by improving infrastructure to allow access to markets; expanding the production of sustainable and commercial crops and livestock through diversification and value adding; providing appropriate macro-and micro-economic policies and structures to give a practical performances to allow continued growth in the sector.

CONCLUSIONS

The Government's policy initiatives are aimed at practical ways of raising efficiency of production, making agricultural industries more competitive, and to involve our people in productive uses of their traditional lands.

Agriculture is a renewable resource and as such it can make long term contribution to reducing law and order problem. The policy and decision makers must reason beyond the technical horizons and biases to embrace a wider vision of agriculture encompassing both the local and the export markets. We need to recognize that the bulk of the agricultural activity in PNG is subsistence agriculture based on traditional group land. We must accept the true food producers in PNG are women and that it is women of this Nation who need support and information if productivity is to improve.

The agriculture sector is recovering from the recent effects of the prolonged drought and and the extensive frost of the 1997/98 El Nino Effect. Food supplies from food gardens are increasing rapidly as more gardens are coming into production. Tree crops production is also improving.

The agriculture sector is at the threshold of a new era. Th challenges facing the sector requires a collective effort by all, to seriously address the constraints to production, delivery of essential goods and services, and the basic support that the farming community require to realisze the stated sectoral goals and objectives. All stakeholders in the agriculture sector must pursue practical goals in developing agriculture. There are areas where we can never be competitive in the global market place, but there are others where we can not only compete but excel. We need to solve micro-economic issues at the village level and community level, as well as addressing the larger macro-economic issues of world trade.

The budgetary support to the agriculture sector has been declining in recent years. However the Government continues to require the DAL to support the Commodity Boards and Industry Incorporations that have been created as part of the overall sectoral reform. It is the Government's expectation that this institutions will be in the front-line to deliver essential services like research, extension information, marketing advice, pest and diseases control measures, and provisions of credit to our farmers.

Our farmers of today are much younger and better educated than before, and hence require a much higher level of technical support,

through more organized and well staffed research and extension services. Over the next six months the DAL is anticipated to be fully reorganized so that it can maintain complete monitoring of the performances of all agricultural institutions to ensure that their programmes are directed towards the Government's central objective of ensuring viability in the sector and sustained growth to increase income levels and rural standards of living.

FOCUS FOR AGRICULTURAL RESEARCH IN PNG

Alkan Tololo[1] KBE., R. Ghodake[2] and V. Kambori[3]

I. INTRODUCTION

In Papua New Guinea, agriculture remains the main source of livelihood, employment and income for eighty percent of about 4 million people. In fact, agriculture is the way of life in rural PNG. Many forums and consultations over the past 25 years have clearly established that the agricultural development is the key to the socio-economic development and hence to the overall human welfare in PNG. This does not need any more emphasis.

However, in today's presentation, we do wish to emphasise the importance of agricultural research, and demonstrate how well targeted and effective agricultural research can contribute to the improved productivity, efficiency and sustainability. All this is the heart of the entire process of agricultural transformation and socio-economic development.

Agricultural research is one of the most important catalytic factors to help accelerate the productivity of all other factors of production in the economic growth. Studies in many countries, including PNG, have shown that agricultural research is a very attractive form of public investment and can give rates of return in the order of 35% or more (Menz 1994).

Particularly important is to note that PNG has unique agro-ecological environment, biological diversity, rugged land terrain, and is inhabited by unique people with diverse socio-cultural background. Therefore, we have unique needs for agricultural research and development. Such needs cannot even partially be met through regional or international efforts.

Therefore, I regard agricultural research in Papua New Guinea as highly essential. It needs to be recognised as long-term economic and social investment for the growth and sustainability of the agricultural sector as well as of the entire national economy.

Before going on to the focus for agricultural research in PNG, we wish to provide a brief overview of the National Agricultural Research System in PNG- called NARS.

II. THE PNG NATIONAL AGRICULTURAL RESEARCH SYSTEM

The history of NARS in PNG goes back to the establishment of the Lowlands Agricultural Experiment Station, at Keravat, in 1928, and the Highlands Agricultural Experiment Station in the Aiyura Valley after the World War Two. During the 1950s, research stations were established in Central, Morobe, and the Western Hghlands (Charles 1982).

Since then the NARS has changed and expanded. Prior to 1980 the bulk of the agricultural research in the country was carried out by the then Department of Primary Industry, now the Department of Agriculture and Livestock.

In the early eighties, after a major review of the Department's crop research programme by the International Service for National Agricultural Research (ISNAR 1982), the NARS in PNG was substantially reorganised (Sitapai *et al.* 1994). Commodity-specific research institutions, associated with their respective commodity boards, were established. The PNG Oil Palm Research Association was the first to be formalised, followed by Cocoa and Coconut Research Institute, and then Coffee Research Institute. In

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1991, Ramu Sugar established a sugarcane breeding centre, and has since expanded into other related disciplines.

The responsibility for research into food crops, alternative cash crops, spices and essential oils and livestock remained a function of DAL until the recent establishment of the National Agricultural Research Institute in 1996, and launched in 1997. The formation of NARI was considered to be one of the major development initiatives by the PNG Government to contribute to and bring about sustainable development in the agricultural sector (DAL 1996).

Besides, the other bodies undertaking some formal agricultural research are:

1. Department of Agriculture and Livestock,
2. PNG University of Technology through its Departments of Agriculture and Applied Sciences, and the Bio-Technology Centre,
3. Trukai Industries,
4. Fresh Produce Development Company,
5. Wau Ecology Institute, and
6. Two Technical Missions: one from the Republic of China and another from the Mainland China.

Several Non-Governmental Organisations (NGOs) undertake some research, while the farmers themselves undertake a vast amount of non-formal trials and testing of new ideas and material.

The major agricultural research institutions and their respective mandates are given in Table 1 (Ghodake 1998a). The linkages of these research institutions with extension, farmers and developmetn are depicted in Figure 1.

III. FOCUS FOR AGRICULTURAL RESEARCH

Although our presentation on the "focus for agriculture research in PNG" has emanated from the NARI's perspective (NARI 2000), it covers and represents the overall perspective of the entire NARS in PNG.

The overall focus for the agricultural research in PNG will need to be on addressing the key national development issues. Therefore, the focus has been and will continue to be on technology development, knowledge creation, and information dissemination on such issues.

1. First such issue being, ensuring supply of adequate quantities and qualities of balanced food and nutrition - calories, protein, essential vitamins, etc. for healthy life for people including producers and consumers;

2. Second being, generating employment and improving income - both cash and non-cash - so as to empower the people including producers and consumers to have access to the higher standard of living and well being;

3. Third being, increasing efficient use of natural and man-made resources such as land, labour, capital, skills, and genetic diversity, through increased productivity per unit of these resources;

4. Fourth being, improving benefits to the less privileged people such as women who have been a neglected lot in the development so far, staying in economically depressed or environmentally threatened or marginal and less favoured areas; so as to advance social welfare and equity; and

5. While doing all these, the fifth issue is of ensuring efficient management of resources so as to assure the long-term sustainability of these resources not only for the present generation but also for the generations to come.

However, we must note that all these cannot be realized simultaneously and with equal focus and vigour. Therefore, focus must be weighed and balanced to ensure the optimization of the overall human welfare - the ultimate indicator of socio-economic development.

Having presented the overall focus, now I wish to give our perspective on the strategic approach to research, and some currently focussed areas of research in PNG. First to begin with approaches which are ten in number.

IV. STRATEGIC APPROACH TO RESEARCH

4.1 Applied and Adaptive Research

The first strategic approach is that agriculture research in PNG is basically an experimental and adaptation programme. Most is applied, problem solving, and need-based. The aim generally is at striking an effective balance between the use of farmer's existing and indigenous knowledge, and adaptation and application of established scientific principles.

This is done by adopting a systems approach and conducting research through multidisciplinary research teams, so that all aspects of the farm-household system and its environment are considered and captured.

4.2 Research-Development Integration

The second approach is that by virtue of its applied and adaptive nature, agriculture research in PNG must essentially be oriented to and integrated into the overall development of the agriculture sector and the national economy. Research and development processes must encompass identification of constraints and opportunities; and technology generation, adaptation and dissemination. The focus is required to be on the testing and validation of integrated production and marketing systems, technology utilisation, and enterprise development.

A mechanism of out-reach programme is being developed under NARI, wherein adaptive research, farmer/extension training, and information and liaison are to become central focus, through which researchers, farmers and extensionists will interact to generate, share and use knowledge.

The key manifestation of development integration is an effective demand as assessed on the basis of:

1. First, the market parameters in terms of quantities, prices and dynamics of all these;

2. Second, the household needs to consider subsistence, safety-net, taste, preferences, and household food security for both producers and consumers; and

3. Third, the domestic and international trade to account for various dimensions such as export, import, foreign exchange, self reliance of the agriculture sector, and national food security.

4.3 The Smallholder Focus

Now coming to third approach. Most of the 85% of the population, who are dependent on the agricultural sector in PNG, are smallholder semi-subsistence/ semi-commercial farmers. These farmers are and will be the main source of agricultural growth, employment, foreign exchange, improved income distribution, overall rural development and broad-based socio-economic development.

1. Therefore, the smallholder agriculture needs to be transformed through increased on-farm productivity, and that requires a significant, well-targeted and effective agricultural research;

2. The increased integration of the smallholder sub-sector into the market economy is crucial to ensure fair competition and efficient use of resources; and

3. The smallholders need help on appropriate knowledge and information to work towards food security, commercialisation, market integration, and sustainability of production.

This will require that agricultural research and information must focus on the needs of the smallholder farm families. Research efforts of

NARI and, to a large extent, of export commodity institutions such as Coffee Research Institute and Cocoa Coconut Research Institute, are directed towards the smallholder semi-subsistence farmers.

4.4 Stakeholder Participation and Partnership

In order for research to be cost effective, relevant, and impacting the development; it must be participatory with farmers and stakeholders and be conducted in partnership with private sector, NGOs, women groups, commodity organisations, provincial governments, developmental institutions.

This includes the involvement and participation by farmers, especially smallholder farmers, in all the stages of technology development and adoption such as problem identification; design, testing, adaptation of technology; and, to an extent, in evaluationand impact assessment.

This will also require forming partnership and forging alliances with national, regional or international institutions, organisations, groups or individuals that are working to address similar needs.

4.5 Agro-Ecological Basis

Farming regions in the country vary widely in terms of diversity in its natural resources, agro-ecological environment, and socio-cultural factors (Ghodake 1998b). Applied agricultural research must, therefore, be regionally based in order to consider area specific constraints, needs, resources, and opportunities; and to develop and adapt appropriate technologies and information for different agro-ecological regions of the country. This will effectively enable material and methods to be tested and adapted in localised areas and in the farmer environment.

Researchers will need to be working directly with selected districts in each agro-ecological zone and will need to be contributing to district develpment plans. This is consistent with the decentralized approach to development, adopted under the reformed systems of provincial and local level government.

4.6 Use of Indigenous Knowledge and Locally Available Resources

PNG agriculture has evolved over centuries, and is based on technologies and methods designed by farmers on the basis of their experience and informal experimentation. Techniques and knowledge emerged to suit discrete environments, cultural values and available resources. Indigenous knowledge has a number of strengths and can contribute to contemporary needs (Hardaker *et al.* 1994). This knowledge will have to be taken into account in the design and modification of new technologies and options. Similarly, locally available resources such as soils, fodder and skills must be optimally used for improving productivity and efficiency.

4.7 Environment Friendly and Culturally Acceptable Agricultural Technologies

In view of the increasing concern for environmental protection, resource degradation and exploitation, and adverse effects on human welfare; the emerging research will need to consider all such negative implications both in the short and long run, while designing new technologies and methods. This means priority to work on technologies such as biological control, integrated crop and pest management, organically grown food, sustainable land management, use of genetic potential, and optimum soil-water use.

All technologies and information will need to be consistent with the socio-economic needsof the farmers and must be acceptable to them. This will help preserve the strength of traitional agriculture and contribute to healthy human life, leading to sustainable growth and development.

4.8 Export Oriented and Import Replacement Technologies

Strategies to improve the PNG economy include diversification and expansion of agricul-

tural exports and reduction in agricultural imports. PNG currently imports in the order of K500 million worth of food products and agricultural inputs annually.

Agricultural research must focus on technologies and opportunities that will help the Nation diversifying and expanding its agricultural export and, where appropriate, in replacing imports of food items and agricultural inputs. Some examples include research on livestock stockfeed, export-tree crops, fruits andnuts, grain crops such as rice, corn and peanuts; and a number of minor crops both indigenous and introduced.

V. CURRENT FOCUS FOR AGRICULTURAL RESEARCH IN PNG

Prioritising and focussing of agricultural research is continuous, iterative and dynamic process. The current knowledge and perception allow us to highlight the following 11 areas of the current focus for agricultural research in PNG.

5.1 Improved Productivity and Production

Primary focus of agricultural research has been on improving and sustaining productivity of crops, livestock, and farming systems through improved husbandry practices, better pest management, and high yielding material. This focus will continue for all crops including staples and vegetables, and livestock species. Focus will also be on increasing production, especially for the established and emerging export crops.

5.2 Integrated Crop/Pest Management

Tropical PNG environment is congenial to crop production and is equally congenial to pests, diseases, and weeds, which cause heavy crop losses both in quantity and quality. Research focus has been and will continue to be on development of integrated pest and crop management practices, including biological control, cultural practices, plant tolerance and resistance, plant derived pesticides, and selective chemical control.

5.3 Crop Diversification

Research on identifying and introducing new and emerging crops to become alternative sources of food and cash has been undertaken for some time. This focus shall continue on crops like vanilla, balsa, okari-nut, galip-nut, cashew-nut, mangoes, spices, and on grain crops such as rice, corn and peanuts. All aspects of these crops will need attention, including post-harvest, processing, quality assurance, and marketing.

5.4 Export Tree Crops

The past research focus in the export-tree crops such as coffee, cocoa, coconut and oil-palm, was on productivity through crop management and plant breeding, and pest and disease management. However, smallholder productivity did not improve significantly, and certainly has a big potential. Therefore, increaseing attention is now focussed on improving productivity of smallholder farming systems, control of pests and diseases, quality assurance, designing novel practices for small-holders, and some work on post-harvest drying and processing. Efforts will also continue on the crop improvement for quality, pest and disease tolerance, and intensive inputs.

5.5 Small-holder Village Livestock

Smallholder village livestock has the potential to address the present level of low nutrition (protein), income, and sustainability in the rural PNG. The research focus clearly appears to be in the area of integration of small livestock such as sheep, goat, poultry, rabbits into the farming systems; utilization of locally available feed and fodder resources; collection of information and monitoring; and understanding and alleviating factors that constrain technology adoption in this area.

5.6 Sustainable Land Management

Land being the basic resource for agriculture, focus on land management research is crucial and continues to be a priority in improving and sustaining productivity of this resource.

Research focus will need to be on various options such as:

1. Understanding and documentation of current agro-forestry practices;
2. Developing fallow management and fertility maintenance practices;
3. Developing nutrient management techniques for vegetable cropping, including use of inorganic fertilisers; and
4. Managing risks and impacts of excessive and deficient soil water in traditional and innovative cropping systems.

5.7 Management and Development of Genetic Resources

PNG agriculture is endowed with a rich and diverse genetic resources of plants, crops and livestock species; which are a basic research resource for the development of agricultural technologies. This resource has been grossly neglected due to lack of funding and management abilities. The collections have been partially and periodically lost due to natural calamities such as droughts, floods, frosts, pests and diseases.

NARS will need a renewed focus on rehabilitation of available material; undertaking collections of lost and new cultivars; documenting, characterisation and evaluation; maintaining in various forms such as *ex-situ, in-vitro* and *in-situ*; and giving advice on the utilisation of the material for crop management and improvement.

The concerned institutions will need to develop policies and strategies on genetic resources and take into account the resolutions of the Earth Summit, 1992 on maintaining bio-diversity and safeguarding the intellectual property rights.

5.8 Improved Post-Harvest and Value Addition

Important features of agricultural products in PNG are perishability, bulkiness, low value to weight, low nutritive value to price, seasonality, and surplus output. All tree crops are exported with only marginal processing.

If the status of the people growing these crops is to be improved, a pre-requisite is to improve the market demand for these crops through improved post-harvest and value addition, including improved handling, storage, processing, and transport.

At present very little attention is given to this area. Therefore, agricultural research will need to increasingly focus on designing post-harvest technologies and methods that will add value to the product.

5.9 Marketing and Socio-economic Research

Marketing and socio-economic research is another crucial area that has received very little attention. Parameters of demand at household, market and international level are needed for research planning and prioritization. While socio-economic research will aid in generation and adaptation of appropriate technology and information. Future planning and research focus will be increasingly based on results of such marketing and socio-economic research.

5.10 Databases and Monitoring

There is a general lack of databases and monitoring systems, which form the basis for rationalisation and undertaking of appropriate research, and assessment of impacts. A research focus has been and will be on developing and maintaining databases such as GIS, farming systems, soil quality, sustainability indicators, long-term soil and crop monitoring, marketing information, socio-economic information, weed information, etc.

5.11 In-Depth Research Reviews

Continued efforts are certainly required to undertake in-depth research reviews on certain topics and crops. Immediate focus will be on reviewing sweet-potato research and pest management research on taro. Such reviews will allow strategic planning for further work.

VI. MAJOR ISSUES IN AGRICULTURAL RESEARCH

Before we conclude, we wish to take this opportunity out bring but three major issues in agricultural research to this August gathering.

6.1 Financial Support and Stability

The first issue relates to financial suport and stability. Agricultural research institutions in PNG are very young, much younger than the Independent State of PNG. These have been emerging and progressively growing. They need a core but guaranteed financial subvention from the public purse. Being long-term nature of research investment, especially in the context farming systems, land management, livestock and tree crops; the funding requires to be adequate, consistent and sustainable over longer-term. Currently, the Government support is less than 50% of what is planned to be a bare minimum.

6.2 Institutional Capacity and Human Resources

The second issue concerns the institutional capacity and human resources. This is a sovereignty issue of having our own ability and capacity to plan and implement applied and adaptive research and development programme, which will be relevant to the needs and aspiration of the Nation. This capacity improvement is needed in the area of scientific and technical manpower; equipment and facility; databases and networking; and collaboration and partnership. This requires initial investment in this very important science-based knowledge sector. Current scenario is far from satisfactory.

6.3 Policy on Agricultural Research and Development

The third is on policy. The Nation lacks well articulated national agricultural development policy and hence focused agricultural research policy. Research institutions are operating in policy vacuum. That, to an extent, hinders individual institutions in developing effective research policy and strategies for implementation. Given the nature of PNG agriculture and long gestation period of research investment, often difficulties are experienced by policy planners and politicians in appreciating the importance of agricultural research. Concerted efforts must be made by all concerned to develop and implement coherent national policies in the area of agricultural trade, production and marketing, food and nutrition, bio-diversity, intellectual rights, human resources in the agriculture sector, etc.

VII. CONCLUSION

To conclude, over the last two decades, the National Agricultural Research System in PNG has undergone considerable and progressive reforms, leading towards autonomy and flexibility so as to address problems, allelviate constraints and explore opportunities for the agricultural development in the country.

In this context, we would like to stress that well-supported agricultural research in PNG has a huge untapped potential in developing agricultural sector and hence in contributing to the socio-economic development and human welfare of the Nation. We, as a sovereign Nation, must fulfil our role and obligation to strengthen and support the agricultural research institutions in the country for nurturing scientific knowledge and information. This will certainly lead us towards prosperity.

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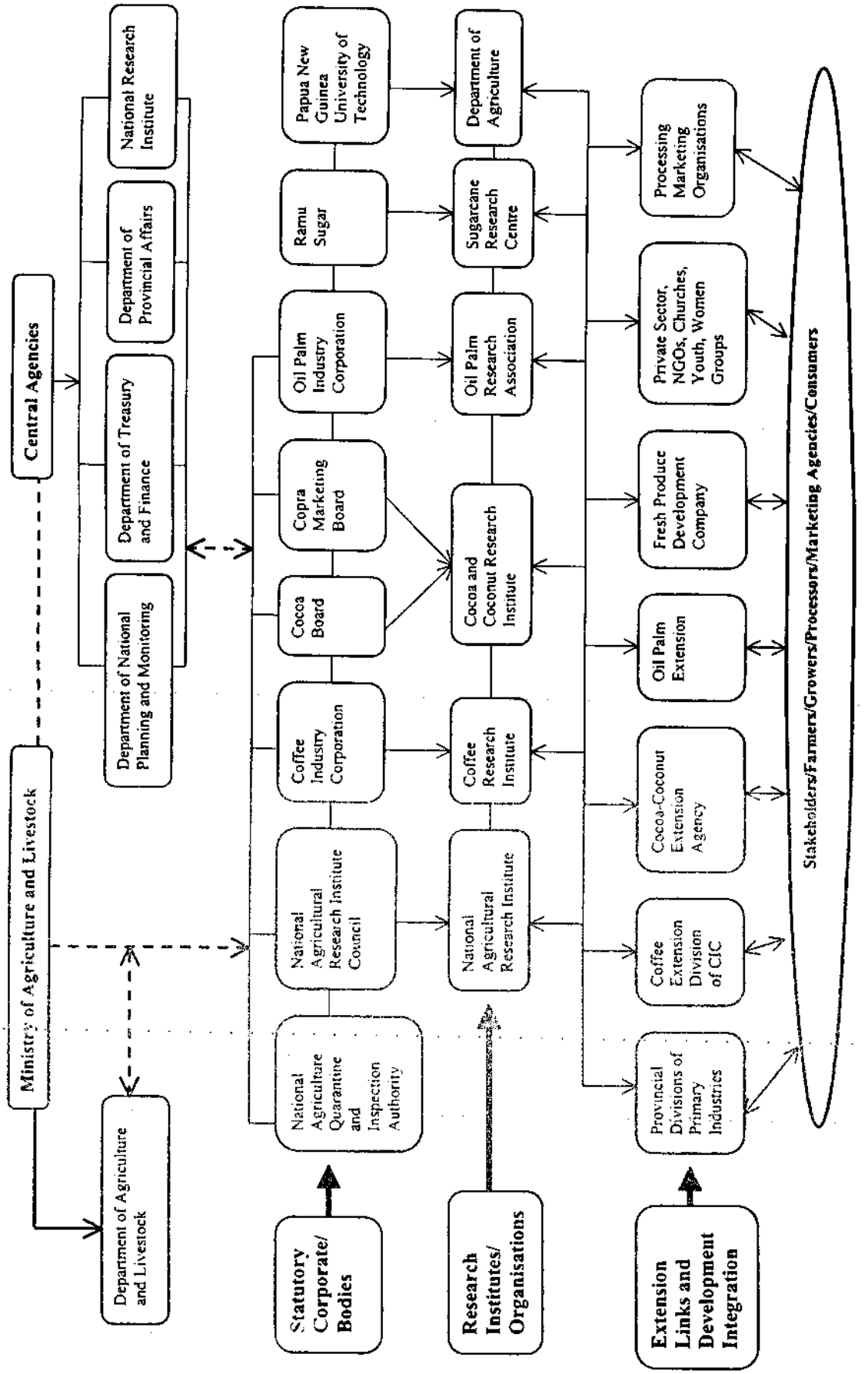
Table 1. **Major Agricultural Research Institutions in PNG (Ghodake 1998a)**

Institute	Broad Research Mandate
NARI - National Agricultural Research Institute	Food crops, small livestock, alternative cash and food crops (fruits and nuts), and spices, resources management issues, and provision of diagnostic, analytical services, farming and inter-cropping research, agro-forestry, control and management of pests and diseases, socio-economic research, soil, land and water management practices, germplasm maintenance and agronomy, imporvement and adaptation of small livestock species, assessment and improvement of feeds and pastures, and livestock nutrition and management.
CRI - Coffee Research Institute	All aspects of coffee improvement, husbandry and processing, disciplinary research in areas of agro-physiology, genetic improvement, pest management, weed management, soil and plant nutrition, and coffee-based farming systems including inter-cropping to address the needs of smallholder coffee growers.
CCRI - Cocoa and Coconut Research Institute	Cocoa and coconut production and improvement, cocoa management practices, soil and soil nutrient, post harvest, quality improvement, downstream processing, fermentation, drying, small-scale operation, breeding for Low versus high input production systems, introduciton of varieties for breeding purposes.
OPRA - Oil Palm Research Association	Oil palm management, husbandry agronomy, soil nutrients - specifically biological and economic responses, soil plant interaction, volcanic and non-volcanic soils, importance of phosphorus nutrition, smallholder fertiliser demonstration, effective biological control of *Sexava* and monitoring of potential and new insects, crop resource mapping and standardisation.
Sugarcane Research Centre Ramu Sugar Limited	Sugarcane management, husbandry, crop improvement, soil and plant nutrition, pest and disease control, weed control, quality improvement.
Department of Agriculture and Biotechnology Centre Univesity of Technology	Research on smallholder food crops and livestock, including some strategic research in breeding, plant diseases, adaptation of livestock, and relatively basic research in plant and animal sciences.

Figure 1. NATIONAL AGRICULTURAL RESEARCH SYSTEM IN PNG (Organisational Chart and Linkages)



STRATEGIC DIRECTIONS FOR THE PAPUA NEW GUINEA CO-OPERATIVE EXTENSION SYSTEM IN THE NEW MILLENNIUM

Samuel B. Lahis[1]

1. INTRODUCTION

Recent legislative changes to the structure and functions of Provincial Governments and Local Level Governments (PGLLG) have mandated new roles and responsibilities for national and provincial departments and agencies delivering extension and other services to rural communities in PNG. The legislated mandate places the PNG Department of Agriculture and Livestock (PNGDAL) in an ideal position to review its future role as the lead agency in facilitating agricultural development and serving the rural people of PNG.

The PNGDAL has completed a series of institutional reforms under the government's reform program with the objective of improving delivery of services to the rural sector. These included the establishment of the Commodity Corporations such as the Coffee Industry Corporation (ICI), Oil Palm Industry Corporation (OPIC), Fresh Produce Development Corporation (FPDC), Livestock Development Corporation (LDC), National Agricultural Research Institute (NARI) and the National Agricultural Quarantine and Inspection Authority (NAQIA). In addition, Public Investment Programs (PIPs) jointly implemented with provinces were transferred to provinces. These changes have resulted in PNGDAL retaining the core functions of policy formulation and development and regulatory roles, including monitoring and evaluation.

Significant changes have also occurred in some sectors of the agriculture sector. For example, the recent establishment of the PNG Cocoa and Coconut Extension Agency (CCEA), a subsidiary of the PNG Cocoa Board and the Copra Marketing Board, to manage, co-ordinate and monitor cocoa and coconut extension services is further extension of the devolution of extension functions initiated with the establishment of Coffee and Oil Palm Industry Croporations.

These legislative changes and mandates dictate new institutional roles for the PNGDAL, which must be clearly defined, and if necessary legislated. It is clear however, that the devolution of roles and responsibilities previously held by PNGDAL to other statutory organisations does not mean a lesser role for PNGDAL in its important role as the lead agency for facilitating agricultural development throughout PNG. It means that PNGDAL and its collaborating partners must forge new working partnerships based on **co-operation, collaboration and interdependence.**

In essence, the changing roles of organisations and agencies involved in promoting agricultural development calls attention to developing and promoting a PNG Co-operative Extension System (PNGCES) in which all stakeholders have a collective input in improving the sector and livelihoods of our rural people.

Under a PNG Co-operative Extension System it is envisioned an agreement between research institutes, national and provincial departments with responsibilities for agriculture and rural development, non government organisations, industry corporations, private sector organisations, institutions of higher education e.g. universities and colleges, and the public at large to respond creatively and co-operatively to the many complex local, provincial, national and international issues affecting agricultural devel-

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opment in PNG.

2. OUR SUCCESSES

In its 40 - plus years, the PNG Agricultural Extension Service (PNGES) has played a key role in the development of Papua New Guinea and its people. Among its contributions are:

- Supporting the growth in agricultural productivity among the various sub-sectors, including coffee, cocoa, coconut, oil palm, tea, rubber, sugar, spices, fruits and vegetables, livestock and food crops through the adoption of improved technologies, management and farming practices.

- Educating and training young people to improve their ability to communicate, make decisions and prepare for the work force in the sector.

- Advising and training farmers to manage their projects (small businesses) and provide employment opportunities.

- Providing information and educational materials on agriculture to schools, local and overseas organizations and the general public.

- Maintaining close liaison with the private sector on agriculture development.

- Corporatizing activities of the department under industry corporations, viz coffee, cocoa, coconut, oil palm, agricultural research, quarantine and inspection services.

- Implementing joint agriculture investment programs with provinces.

- Aggressive and highly successful human resource development program.

3. THE CHANGING CONTEXT FOR PNG CO-OPERATIVE EXTENSION SYSTEM

The PNGES has been successful in serving the needs of families and improving the lives of rural communities throughout PNG.

Today, however, the extension service faces serious new challenges nationwide and outside local communities, and in the nation generally. These changes imply an increased need for strategic planning to achieve the PNG Co-operative Extension's mission and realise the vision for the future. Among the political, social and economic factors affecting the context in which PNGDAL and collaborating organisations and agencies conduct their extension programmes are these key factors:

1. Major restructuring of the Provincial Governments and Local Level Governments (PGLLG) is under the reform program. The low pace of implementing the reforms has frustrated the efforts of both government and non-government organizations involved in agriculture development programs. For PNGDAL and the provincial departments, seven major Public Investment Programs (PIPs) have been suspended by the Department of Finance until provinces have the capacity to manage the resources and implement them, and financial management and accountability procedures are established.

2. A major national economic restructuring during the past five years is due to the Bougainville crisis and the downturn in the economy. The Bougainville crisis and the consequential financial problems faced by the country continue to affect the economy. The government's structural adjustment program (SAP) under the World Bank/International Monetary Fund will continue to be the major source of assistance for getting the economy back on track.

3. A major shift in national priorities and policy. Under the reform program, provinces, districts and local level governments are the key

areas for government intervention, and delivery of education, health, community development and other services.

4. Spreading disenchantment with the role of government, particularly national and provincial governments. There is growing belief that local communities can find solutions to complex issues that affect them, particularly in the delivery of education, extension, marketing, health services and provision of infrastructure to develop these communities.

5. Increasing demands for accountability in the use of public funds. There is a growing concern over the use of public funds for expenditures that are considered wasteful and unnecessary. The recent cases concerning the NPF, Sandline Affair, Cairns Conservatory, PANSAT and the CIC legal case are examples of the public's demand for greater accountability on state resources.

6. Increasing environmental concerns, including land, water, and air degradation and the potential for global climate change. The effects of the El Nino phenomenon have resulted in the long drought and the huge losses in industry revenues. The effects of the drought and frost have been devastating for approximately 1.2m people in rural communities. Rehabilitation program to bring affected areas into production will take up to 2 years for recovery - if the drought does not continue.

7. Growing consumer concern about food supply, such concerns include not only food security, but also food safety, nutrition and equity, that is, which foods will feed the most people at the least cost to the environment.

8. A growing national debt. The debt has been exacerbated by recent economic slowdowns which are being addressed by the SAP.

9. Major restructuring of our food and farming systems to one that is biologically and managerially intensive, environmentally sensitive, vertically integrated, and large in scale. Accompanying these changes is an increased emphasis on smallholder farms/ rural community concerns and alternative farming practices such as organic production.

10. Changing priorities for national government support for agriculture.

4. THE TASK

The PNGDAL has a history of engaging in strategic planning. Just a week ago, the Department and FAO of the United Nations co-hosted a workshop to discuss proposed changes in the legislation and administrative structure of the department and the sector. Other recent efforts were in 1997 when the DAL initiated a re-structuring program with Technical Assistance from the Asian Development Bank (ADB) and completed in 1999. Prior to that, the department published in 1996 the White Paper on Agriculture and the Medium Term Development Strategy for the Agriculture Sector 1996 - 2000 and beyond. Extensive consultation with provinces through the National Agriculture Council (NAC) and regional meetings with provincial authorities and private sector contributed towards completion of the White Paper on Agriculture and the Medium Term Development Strategy.

The establishment of NARI and NAQIA in 1996 and 1997, respectively, were significant milestones in the evolution of a future PNG Department of Agriculture and Livestock and extension service. The initiative to re-structure the PNGDAL and the extension service is appropriate, particularly at this period when roles and responsibilities of national and provincial departments under the reform program are being examined and redefined.

The restructure of PNGDAL and provincial extension services should be seen as part of one

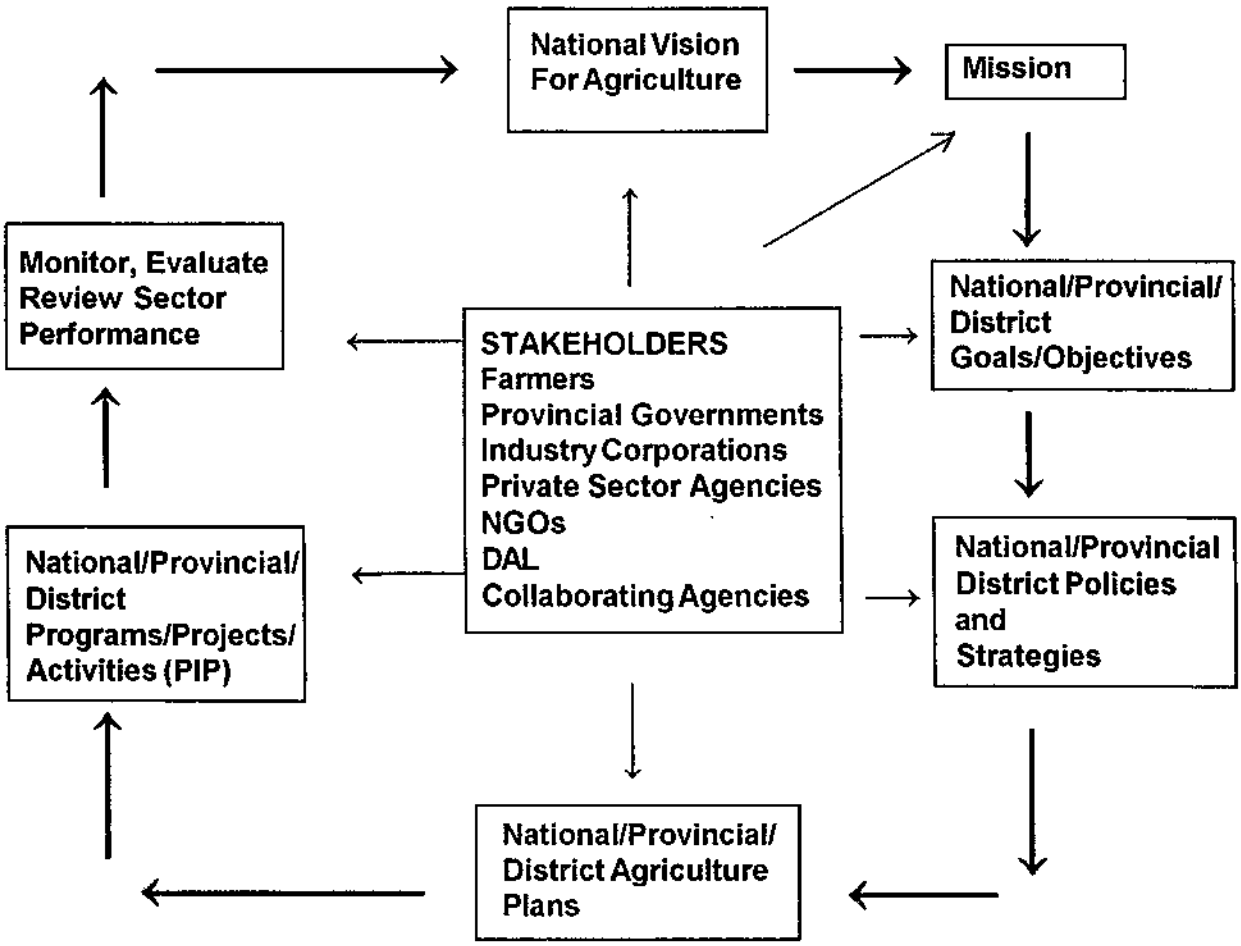

Figure 1: Framework for Cooperation and Linkage Among Various Stakeholders in the Agriculture Sector

major reform program involving all stakeholders in the agriculture sector. In order to produce a meaningful and effective strategy, mission, vision and organisational structure for a future PNG Cooperative Extension System, extensive consultations with provinces, industry corporations, private sector and non-government organisations and key government departments/ agencies will be necessary.

The task will be to review existing strategic plans from provinces, industry corporations, research institutes and universities and colleges, national DAL and other collaborating organisations. Workshops should be organised nationally and key stakeholders invited to share their observations, wisdom and views regarding the future extension system. Strategic issues that have wider implications on the future extension system should be identified and discussed at these workshops.

A quick review of the White Paper on Agriculture, the Development Strategy and other documents indicate the following.

1. There is no consensus among key stakeholders on the mission, vision and values of DAL. The existing statements are vague and need to be re-written. The mission, vision and values statements must be consistent in all official DAL and government

documents.

2. There is no consensus among key stakeholders on the goals (or objectives) of DAL. The existing goals need to be reviewed and re-written to reflect future goals or objectives as seen and agreed by other stakeholders.

3. There are either vague statements or no statements from Provincial Departments on their mission, vision and goals for agricultural development in their respective provinces. These statements should be discussed and agreed upon during consultation meetings/ workshops so that a national view on development of the agriculture sector can be fomulated. Out of this would emerge a National Agriculture Plan.

The task has begun with an internal re-structuring exercise within National DAL (NDAL) and is continuing with Technical Assistance from the FAO in reviewing agriculture legislation and management structure. Consultations with Provincial DAL (PDAL) in Morobe Province were initiated on future framework for co-operation and collaboration between NDAL and PDAL and other agencies indicated strong support for closer working relationships and linkages at all levels. The framework is shown in Figure 1.

Further and wider consultations with our collaborating partners, particularly, the industry corporations, private sector and non-government organizations are needed.

It is hoped that through these and future consultations will emerge a national mission, vision and values statements that provides a philosophical foundation and framework for PNG Co-operative Extension within the sector's overall mission and vision under the National Agriculture Plan. Secondly, there is consensus that the research/ extension linkage remains a key element in the system and it is critical to find ways to maintain, strengthen and manifest this important partnership.

5. MISSION

As stated elsewhere, a mission statement for the sector and NDAL needs to be agreed upon by key stakeholders. Several versions of the mission statement have been published in DAL documents. A mission statement should be succinct and simple, but encompass those core objectives and goals of the sector. If existing mission statements are acceptable to participants of this NAC, then the NAC should adopt the statement for official use in all government documents.

The mission statement for the PNG Co-operative Extension Service should corroborate and support the mission statement of the sector. For example, **the mission statement of the PNG Cooperative Extension Service is to enable people to improve their lives and communities through partnerships that enable experience and research knowledge to be shared and utilized.**

6. VISION

Vision statements have been published in DAL documents. These need to be revised and agreed upon by stakeholders. **A PNG Cooperative Extension Service should provide innovative, flexible and participant-driven programs that promote new ways of learning, thinking and acting. This would enhance the quality of life by promoting individual growth, strengthening families, improving economic well-being of businesses, enhancing the environment, and building stronger communities.**

A future PNG Co-operative Extension Service would be committed to partnerships among districts, provinces and national governments, colleges, universities, industry corporations, private sector and non-government organizations. The strength and durability of these partnerships depend on shared concerns, shared responsiblity, shared authority, shared costs, and shared recognition. The key concept in all

these partnerships is **co-operation,** thus, the name **Co-operative Extension Service.**

7. VALUES

A statement of the core values that are important in achieving the mission and vision of the Extension Service and help improve the lives of people and rural communities would re-enforce the mission, goals and objectives for the sector. At present, there are no value statements in current documents.

Some of the values might be:

- excellence in building individual competence, credibility and integrity to deliver innovative and vital programs.

- collaboration: optimize resources and program outcomes through co-operative partnerships both within and outside of extension.

- results oriented programming: deliver programs that are valued by people because they succeed.

- responsiveness: respond to people's needs in a timely, efficient and resourceful manner.

- commitment to the future: anticipate future needs and develop appropriate programming.

8. STRATEGIC ISSUES AND ACTIONS

The strategic issues that will guide the evolution of a PNG Co-operative Extension Service into the 21st century include:

1. Defining and describing the PNG Co-operative Extension System
2. Sharing leadership throughout the system
3. Ensuring high-empact outcome-based programming
4. Optimizing human, financial and technological resources
5. Maximizing collaborative relationships
6. Realizing pluralism
7. Promoting a contemporary image
8. Engaging in organizational renewal and change.

8.1 Define and Describe the PNG Co-operative Extension System

Preferred Future: All stakeholders of the PNG Cooperative Extension System (PNGCES) have a clear and consistent understanding of the mission, vision and values of the organization and are able to apply them in achieving program results in which there are shared concerns, shared responsibility, shared authority, shared costs, shared recognition, and shared accountability.

Strategies: Define and describe the PNGCES to fit contemporary society and higher education. Define roles and relationships both within and with external partners, including the public. Some strategies include:

- Involve system partners in dicision making. Make adequate information available for informed decisions. Engage system partners in a process to define and describe the system, including roles, responsibilities, and work functions for various staff and other agencies and organisations.

- Reward meritorious performance with recognition and monetary awards and compensation.

- Assume leadership role and be a team member in the emerging organizational efforts in outreach. Make a strong case to establish a position within the executive of the DAL that has direct responsibility for exten-

sion and outreach.

- Update the organisational structure so that it is flexible and responds to societal needs as they arise.

- Work to establish representation for the interests of outreach and extension on National Planning Committee and Budget Priorities Committee.

8.2 Share Leadership throughout the Systen

Preferred Future: Leaders from public, private and community articulate the organisation's vision and invite public participation. In addition, they organise human and fiscal resources and retain flexibility to optimize results and respond to changing environments. A culture of shared leadership is developed, supported and rewarded. Leadership involves behaviour that is at times both orderly and chaotic, depending upon the situation. The PNG Cooperative Extension Service consciously seeks and models a variety of leadership styles for achieving balance and success throughout the system, in particular for welcoming new ideas that improve outcomes.

Strageties: Shared leadership is encouraged, supported, and rewarded throughout the system. Strategies include:

- Clearly describe the need for and benefits of shared leadership in the PNG Co-operative Extension System.

- Identify core leadership principles and provide opportunities for both paid staff and others to learn and practise them.

- Establish a series of in-service education experiences for staff and others that are designed to develop and expand their leadership skills throughout their extension career. Experiences may include staff introduction to PNG Co-operative Extension, early career opportunities for staff who inspire to roles of greater responsibility and leadership activities for staff who are in leadership roles.

- Review, renew, and describe the roles of other agency staff in the system and establish meaningful leadership development experiences so that these staff are effective as they carry out roles and responsibilities.

- Use assessment tools from the time of recruitment and hiring and throughout an individual's career that will guide both the design for the system's leadership development program and the individual's leadership development experiences.

- Provide personnel, financial, and other resources sufficient to implement and sustain quality leadership development experiences.

8.3 Ensure High Impact Outcome - Based Programming

Preferred Future: The PNG Co-operative Extension Service should strive for and be recognised for excellent educational programming that strengthens the capacity of individuals and families, businesses, communities, and public and private decision makers to deal effectively with issues. Clear program priorities should provide coherence and direction, and they guide how resources are allocated. Administrators and extension staff should document and communicate the impact of programming and evaluate the effectiveness of alternative delivery methods. Effective advisory structures and program partnerships must exist to assist with priority setting, program design, program evaluation, and communication. Technical assistance would be provided through partnerships among professional and technical staff, educators, and administrator. Reporting processes and structures should be based on accountability and the program management needs of the system.

Strategies:

- Insist on program relevance to priority needs.
- Refine mechanisms for establishig issue priorities and related programming

and ensure that resources flow to agreed - upon priorities.
- Sponsor research that addresses identified system priorities.
- Incorporate the policy aspects of priority issues into programming.
- Invite input from partners to determine the most appropriate emphasis for programs for specific periods of time.

- Insist on high quality programming.
  - Develop an agreed-upon definition of high impact, outcome-based programming.
  - Hire highly qualified staff or establish alternatives for appropriate professional development.
  - Support productive, committed staff. Divest non-productive programs and staff.
  - Establish recognitionand reward systems based on program impact and products, not just activity.
  - Establish a juried curriculum review process.

- Direct resources to priority programming.
  - Secure funding to support agreed-upon priorities and program direction.
  - Support research, extension, and instruction collaboration that focuses on the highest priority issues; reaches across the entire extension system and effectively builds on partnerships among educators, researchers, extension staff, and administrators.
  - Develop flexible staffing capabilities to address priorities.
  - Reform administrative processes and procedures to better support priorities and high - impact outcome-based programming.

- Become a learning organization.
  - Develop mechanisms for sharing examples of high-impact, outcome-based programming, a ssessing program shortcomings, and celebrating success.
  - Learn from other organizations through experiences provided by, for example, executives from other organisations, short inter-agency attachments and leadership traiing programs.

8.4 Optimize Human, Financial and Technological Resources

Preferred Future: Staffing patterns reflect both longer-term commitment to the organisation and flexibility to respond quickly to emerging issues. Non-public service staff and volunteers from the communities fill key leadership and program roles and help to expand PNG Co-operative Extension capacity to reach larger numbers of people with indepth one-on-one educational experiences where appropriate. Policies and procedures are consistent with legislative intent and are minimal in number to allow the greatest amount of flexibilityand creativity in the organisation. Professional, technical and extension staff are fairly compensated for the knowledge, experience and skill they bring to their position and for high-quality, outcome-based programming. Technology enhances human resources by providing tools to expand communication alternatives, improve productivity, increase opportunities for collaboration, and allow more timely knowledge access and delivery.

Strategies: To be a viable organisation, the PNG Co-operative Extension Service resources must grow at a rate greater than the rate of inflation

- Tailor staffing to address identified needs and critical issues. Increasing numbers of staff throughout the system will be employed for short-term projects that demand specific expertise, knowledge and skills. Core staff assume responsibilities for oranizational leadership and integrative program management.

- Make personnel decisions at the appropriate place, while at the same time ascertain that they are consistent with policies, guidelines, and regulations. To facilitate this, policies and procedures will be reviewed and modi-

fied.

- Support collaboration among professional, technical and extension staff, and administrators that results in documentation of impact and accountability for quality programming.

- Ensure that renumeration is consistent with a peson's quality of programming, educational background and experiences, and complexity of responsibility.

- Establish priorities and identify alternative funding sources through the program development process. National, provincial and district appropriations continue to provide a base for operations.

- Support the use of state-of-the-art technology with a commitment of financial resources and use it where appropriate and feasible in implenenting administrative functions, connecting with other collaborators regardless of location, and conducting educational experiences that result in high-impact, outcome-based programming.

8.5 Maximize Collaborative Relationships

Preferred Future: To optimize resources and achieve high-impact outcomes from programming, collaborative relatioships are essential. Building such relationships is fundamental to making societal change and creating new possibilities that require diverse expertise and harness innovation from both the public and private sectors. Collaboration requires bringing individuals and groups together so that mutually agreed - upon outcomes are the basis on which programming, roles, tasks and responsibilities are defined and acted upon.

Strategies: Professional, technical and extensions staff become effective collaborators and provide leadership for partnerships that promote high-impact programming. An attitude prevails that promotes cooperation around mutual interests.

- Support collaboration among the public and private sectors to reduce duplication, conserve valued resources, and find lasting alternatives for addressing complex issues.

- Share "best practices" and "lessons learned" so that throughout the system, professional, technical an extension staff and educators find ideas and knowledge that fits their experiences and style for initiating, nurturing and completing collaborative relationships.

- Reward collaboration that results in desired behaviours.

8.6 Realize Pluralism

Preferred Future: The PNG Cooperative Extension Service embraces pluralism. The organization creates and fosters environments that promote mutual respect, value human differences, and encourage collaboration among its stakeholders, staff, programs and audiences or clienteles.

Strategies: Differences among all stakeholders are respected and valued.

Promote an agreed-upon definition of pluralism.

- Increase diversity of employees and volunteers.

- Change the culture of the organization so that it is consistent with the changing demographics.

- Expand exchange programs in whch professionals who are members of an organization can experience being a member of a different organization.

- Invite other professionals to interact with extension staff and admnistrators and other stakeholders through seminars, workshops, and other events.

- Expand in-service training that promote diversity and integration.

- Establish measurable objectives to assess program towards diversity of employees.

- Update organizational policies and procedures to ensure support for diverse staff, volunteers and program participants.

- Deliver innovative programming to address the needs of under represented populations.

- Involve representatives from diverse target audiences in planning and evaluating educational programming.

- Expand programming in rural metropolitan areas to diverse audiences including, but, not confined to limited resource populations, provinces and districts and displaced settlers.

8.7 Promote a Contemporary Image

Preferred Future: PNG Co-operative Extension's contemporary image is clearly communicated and understood throughout the nation by all stakeholders.

The public recognises our program achievements and the organization's ability to access knowledge from local and overseas network partners. People value the contribution of research and education in helping them to improve their productivity and quality of life. Staff of partner organizations and community leaders and representatives have a clear and consistent understanding of the mission, vision, and values of the PNG Cooperative Extension Service.

Strategies: System - wide marketing goals relate to high - impact, outcome-based programming. Adequate resources are committed to marketing to achieve agreed-upon goals.

- Create a vision for marketing leadership, redirect resources or acquire new ones including staff to support and continue a system-wide marketing initiative.

- Identify internal and external audiences and conduct market research to analyze the organization's current image with each audience, identify strategies for updating perceptions and building a preferred image.

- Position the organization to have greater input into development agenda of the nation, provinces, and local communities through targeted communications.

- Set goals, develop a plan and expand opportunities to remain a lead organization for agricultural development with sufficient resources to carry out the mission and vision.

- Develop a high profile promotional campaign, employ a mix of marketing techniques to create the desired organizational image and convey a specific message that informs people of action rquired to receive the promised benefit.

- Promote the mission, vision and achievements at the PNG Cooperative Extension Service by developing resources and methods for effective marketing, establish a marketing protocol and instinct members of the system in the appropriate use.

- Create a media opportunity that highlights quality programming and promotes PNG Extension Services unique contributions to the nation's well being among targetted audiences.

8.8 Engage in Organizational Renewal and Change

Preferred Future: Throughout the organization, change is viewed as an opportunity for growth and as a way to better fulfill its mission The PNG Co-operative Extension Service not only advocates change for those to whom its programs are directed but also for itself as it strives to continually improve on its ability to be responsive to the needs of people in rural PNG.

Strategies: Continual self-examination and review is practised in which programs, administra-

tive procedures, and partnerships are critically examined and changes made.

- Improve the efficiency and quality of programming through organizational structures that are based on need and optimize the use of technology.

- Improve program effectiveness and administrative efficiency both in the public and private sector organizations through structural procedures that lead to that end. Collaboration with provinces and with public, private and non-governmental organizations and agencies would continue to develop.

- Engage both public and private sector staff and volunteers in development experiences that increase their comfort with and propensity towards change.

9. THE SMALLHOLDER SUPPORT SERVICES PILOT PROJECT (SSSPP)

9.1 Project Description

The Project will improve agricultural support services to smallholder farmers in the two most populous provinces of Papua New Guinea (PNG): Eastern Hghlands Province and Morobe Province. This includes support for performance-based agricultural support services on a contract basis, and for shifting the role of government agriculture agencies from directly providing support services to managing service providers. The Project will assist in establishing a **Support Services Contract Facility (SSCF)** in each of the two provinces, provide capacity building for agricultural staff and service providers, and support Project coordination.

9.2 Rationale

Although smallholders account for about 95 percent of the rural population and contribute 70-80 percent of the value of agricultural production, their needs for agricultural support services have not been adequately addressed in the past. The reforms in the agriculture sector initiated in the early 1990s and supported by the 1995 Organic Law were aimed at improving service delivery to the rural population and are still in the process of being implemented. They are in line with the Bank's (ADB) operational stragegy and, in part, have been supported by Bank assistance.

An innovative approach promoted by the Government is the contracting out of agricultural service delivery to make it more flexible, cost effective, and performance focused, and to reach wider target groups. The Project will support contracting-out arrangements that address smallholder needs in areas such as marketing, crop and livestock production, input supplies, farming systems management, training and awareness, and community development. The Morobe government is the first provincial government to experiment with contracting out support services in the agriculture sector. The Project will help to expand and improve upon this initiative. Both the national Government and the provincial governments accord a high priority to the Project, because it will assist them in testing and refining contracting-out arrangements that better address smallholders' needs for agricultural supports services.

9.3 Objectives and Scope

The Project will increase the access by smallholder households in two provinces to improve agricultural support services, thereby increasing agricultural production, productivity, and the income of smallholders and helping to ensure the sustainability of their farming systems. An associated goal is to enhance the status of women in agriculture by focusing support services on food crop production, which traditionally is the domain of women.

The Project has three components: (i) establishment of an SSCF in each of the two provinces to improve performance-based contractual agricultural support services to smallholders, (ii) capacity building for agricultural staff at the national, provincial, district, and local gov-

ernment levels, as wel l as for smallholder supportservice providers including semi-private and nongovernment agencies and groups, and (iii) Project coordination.

The Project will pilot test a promising new approach to the delivery of support services contractingout. If the approach is deemed successful, it will be extended and expanded into other provinces after this Project is complete.

9.4 Cost Estimates

The total cost of the Project is estimated at $11.5 million equivalent, including a foreign exchange component of $2.3 million and a local currency cost component of $9.2 million equivalent.

9.5 Financing Plan

Bank financing will amount to $7.6 million (66 percent of total Project cost). Government financing will amount to $3.9 million (34 percent of total Project cost) on which 24 percent will be provided by the national Government, 53 percent by the Morobe Provincial Government, and the remaining 23 percent by the Eastern Highlands Provincial Government.

9.6 Loan Amounts and Terms

The loan will be in the amount of $7.6 million from the Bank's ordinary capital resources and have a maturity period of 25 years, including a grace period of 5 years.

9.7 Period of Utilization

Until 31 December 2004.

9.8 Executing Agency

Department of Agriculture and Livestock at the nationallevel.

9.9 Implementation Arrangements

A Project co-ordination unit established within the national Department of Agriculture and Livestock will coordinate Project implementation. An SSCF management unit established in each of the provincial divisions of agriculture and livestock will be responsible for management of SSCF, An SSCF steering committee in each province will provide policy direction to the SSCF management unit.

9.10 Procurement

Procurement of goods and services financed under the Project will be in accordance with the Bank's **Guidelines for Procurement** and Government procedures acceptable to the Bank. Civil work contracts, totalling less than $75,000 equivalent, will be awarded on the basis of local competitive bidding in accordance with Government procedures satisfactory to the Bank. Supply and service contracts, each of which will be below $100,000 equivalent, will be awarded on the basis of the direct purchase procedure.

9.11 Consulting Services

The Project will require an estimated 315 person-months of long-term consulting services, consistig of 126 person-months of international consultants and 189 person-months of domestic consultants to assist in Project coordination and in the management of the two SSCFs. In addition, a short-term international consultant will be recruited for conducting wokshops under the capacity-building component. Consultants will be selected and engaged in accordance with the Bank's **Guidelines on The Use of Consultants**, and other arrangements satisfactory to the Bank for the engagement of domestic consultants.

9.12 Estimated Project Completion Date

31 December 2004.

9.13 Project Benefits and Beneficiaries

The main Project benefits will include increased agricultural production, productivity and income in the two provinces. The primary beneficiaries will be smallholder households growing cash

crops on less that 0.5 hectare of land. By focusing support services on food crop production, at least a third of the primary beneficiaries include agricultural staff at the different government levels, who will receive formal and on-the-job training. The skills of service providers will be developed and improved through business training.

10. CONCLUDING REMARKS

The ideas discussed in this paper are not new. At the 1996 NAC held in Alotau, the concept of "Smart Partnerships" was endorsed by the Council. The ideas explored under the "Smart Partnership" concept are discussed here with the same ends in mind; a better organized and coordinated extension service based on co-operative partnerships among collaborating agencies and organizations.

The strategic directions discussed in this paper provides a pathway to achieve ongoing excellence. The PNG Co-operative Extension Service based on these ideals will continue to have a primary responsibility to serve the needs of rural PNG. To fulfill the changing needs of people, businesses, and policy makers, it is imperative that excellence be maintained while at the same time establishing new directions. An era of increasing accountability, a trend among communities toward greater local autonomy, and a new array of funding and human resources are all combining to produce change in extension policies and programming. Therefore, it is important to have a framework from which decisions can be made and resources targetted.

The ideas discussed in this paper provide a context and direction from which realistic goals can be established. The challenge is to have clear direction while maintaining flexibility so that evolution of the extension system is supported and timely opportunities are pursued. An opportunity is before us to create an environment for establishing collaborative partnerships among all stakeholders in the sector that will enhance and improve agricltural extension services delivery to rural PNG. Let's get our act together and get agriculture moving again.

IMPORTANCE OF AGRICULTURAL INFORMATION

Ray Kumar[1]

ABSTRACT

An overview is given of the importance of agricultural information to policy makers and other professionals with the ultimate objective of upgrading technical skills in the rural agriculture sector by providing them with appropriate authoritative information technical and educational materials. The dissemination of such development information through mass media e.g. radio, television and audio-visual aids is also outlined.

The repackaging of scientific information, development, preparation, production and distribution of wide ranging agricultural publications to different levels of agriculturists throughout Papua New Guinea has been well established in DAL but has been declining since 1997 and is currently moribund. There is an urgent need to fund and staff this sector to prevent its collapse. There is tremendous scope for information Servicing, information Transfer, Data Management and Computer Software Information packages and nurture the knowledge sector in PNG by our information professionals teaming up with advanced electronic information sources in Australia & USA.

INTRODUCTION

In his book entitled "The Third Wave", Toffler (1980) divided human history into three major eras or waves. The First wave, from 8000 B.C. to 1750 A.D., was called the agricultural revolution, and was based on farming as the world's primary occupation. In the second wave, from 1750 to 1995, the rise of industrial civilization and the industrial revolution, manufacturing became the principal vocation and the developed world was engaged in or moving towards mass production. The third wave, which began in the mid-1950s, is sometimes referred to as the information age or information revolution and is based on the delivery of services. Here it is pertinent to note form the above scheme that human society was profoundly transformed with each wave and the transition from one wave to the next was seldom easy. Some of the more important features of the information age may be summarised as follows:-

1. **The prized commodity** - information, whether verbal, written or electronically organized, is to-day world's most valuable commodity. Without accurate information, researchers, technologiests, media experts and extension specialists would become incapacitated. All enlightened policy makers now recognized that sound, scientific information must be brought to bear on all public policy issues.

2. **Access to information** - agricultural scientists and farmers in the developed world can have immediate access to scientific and technical information not readily or easily available in most developing countries. For example, CSIRO administrators have been concerned by the decreasing number of research journals available in CSIRO and Australian libraries. But it has been too costly to increase subscriptions. In August 1999, the CSIRO Library Network launched the Electronic Journal Collection giving staff across the country an instant link over 1,800 titles. Electronic journals are much cheaper and at a reasonable cost CSIRO has been able to

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vastly increase their holdings and access for their professionals.

3. **Value of information** - the value of information lies in the fact that knowledge can be used either to guide correct & informed decision making as well as encouraging the introduction of more productive agricultural technologies. (Hua, 1994). For example, the web offers American farmers a way of becoming connected to other points in farming activities. A number of websites have sprung up to provide them with news, agronomic advice and risk management tools, and web-based exchanges, such as Farms. Com, allow them to bid for things like pesticides and fertilizers, and in turn find buyers for their products. Many American farmers now believe that their most valuable harvest may be the data they log in the computer from the land. Using a new software called "percision agriculture" they can link yields in different parts of their fields to particular soil features.

4. **Recent advances in information sector** - tremendous advances have occurred in the fields of information and communication technology. These are, as indicated earlier, already providing, at least in the developed world, easy and complete access to the latest information from across the full range of scientific disciplines. This means that vast quantity of relevant information is available to the professionals almost instantly. Actually researchers such as those in Genomics (the Science of determining the sequences of DNA letter's in an organism's chromosome) cannot function without instant access to day to day development in their disciplines. This is because they need to know whether or not the sequences developed by them have already been discovered. For this purpose, in Australia, all journals are loaded on a CSIRO web server, meaning instant access to scientific information from work, home and even when travelling. All journals in the collections are available as pdf files, which means they look like their printed counterparts.

5. **Information and communication** - Attempting to absorb vast quantities of relevant information available, however, has been compared to "trying to drink from a fire hose". Acutally many people believe that, "We are drowning in information, while starving for Wisdom" (Wilson 1998). And the problem promises to become more severe. Clearly, making information readily available is not the same as communicating. And it is communication among professionals, both within and across areas of specialization, that is needed. Synthesis of information is greatly needed to enhance scientific progress, to facilitate learning, and to ensure the efficient application of new knowledge to the solution of practical problems. For this purpose publication outlets i.e. Scientific journals which provide outlets for topical synthesis that have passed the rigorous of peer review are essential. PNG does have three reputable Agricultural journals and two of these are currently in dire financial straits.

THE THIRD WORLD SITUATION

The development of new information & technologies using computers, satellite communications and CD-ROM, etc has made information processing and dissemination easier, faster and more efficient. However, a group study on new technologies relevant to developing countries has observed as follows:-

> "The introduction of computers and the application of classical computing techniques, while benefiting the modern sector in urban areas, has had little or no impact on the traditional sector of developing countries, especially in rural areas (Seshagiri, 1983)".

The above statement, almost two decades later, still holds true for Papua New Guinea. A part of the problem, as noted by Hua (1994), may be that the policy makers at times find it difficult to understand **the fuss that is being made on information needs as they have other more important priorities, for example, feeding**

the poor and providing health services to the needy. They totally forgot the fact that by meeting the information needs of scientists and farmers they are boosting agricultural productivity thereby reducing poverty.

INFORMATION POLICY

The following considerations as detailed previously (Erai & Kumar 1994) need to be re-emphasized in revitalising the Agricultural Information Sector in PNG:-

1. Assist in the upgrading of the technical skills necessary for the transformation of rural agriculture and livestock sector.

2. Strengthen the delivery of technical extension services by providing them with authoritative information, technical and educational materials. All information needs repackaging for comprehension at the farmer level.

3. Disseminate Agricultural Information to diverse audience.

4. Development, preparation, production and distribution of wide ranging agricultural publications to different strata of Agricultural professionals.

5. Obtain and provide, to researchers, extensionists and other interested agriculturists results of relevant studies conducted elsewhere in the world.

STRATEGIES

The Agricultural Information Programmes would need to be developed to focus on three strata of our society:-

1. Rural Agriculture and Livestock sector composed mainly of smallholders and evolution of an information base for development and planning at village level;

2. Agricultural Extensionists and general public;

3. Agricultural researchers and other professionals.

With a view to implement the policies and strategies outlined above it is proposed that the following units of DAL be strengthened by infusion of more staff and providing finances for their operations.

A. NATIONAL CARIS CENTRE AND CENTRAL LIBRARY

CARIS (Current Agriculture Research Information Systems) deals with information on agriculture research projects currently being carried out in an international co-operative network composed of national, regional and international centres, with the co-ordinating centre located at FAO Headquarters in Rome.

CARIS is a source of information to researchers, planners, managers or administrators, policy and decision makers, production and development specialists. CARIS covers the whole range of research in agriculture and related fields. CARIS in PNG was established in 1987 at the Department of Agriculture and Livestock Headquarters at Konedobu. In 1990, CARIS produced the first directory of Current Agricultural Research in PNG. Fiscal constraints have however, slowed down and frequently stopped these operations. CARIS and AGRIS operations must be greatly strengthened and scattered information units in DAL such as PNGRIS, Marketing, Rural Statistics, etc brought under one umbrella. They would provide information servicing, information transfer, data management and computer software packages. Their operations would benefit greatly by teaming up with electronic sources in Australia and USA.

The Central Library for DAL, located at Konedobu, was established in early 1960s and serves all the agricultural institutions in Papua New Guinea. The main functions of the library is to co-ordinate and provide various library services. It has over

20,000 volumes, most print materials and 500 periodical titles the number of which on current subscription has unfortunately been steadily declining, due to insufficient budgetary allocations, and currently stands at zero.

Today Agricultural professionals in DAL and thereof have no access to recent advances in various facets of the vast agriicultural enterprise in other parts of the world. DAL could consider - subscription to Electronic Journals, along the pattern of CSIRO (vide supra). But this means investment in costly electronic hardware and software and, if past experience is any guide, no funds would be available for maintenance and recurrent expenses. The running and maintenance of electronic facilities is a costly undertaking and these costs continue to rise every year.

B. AUDIO-VISUAL TOOLS

Video programmes can greatly assist the extensionists by showing farmers how exactly to do something or what a crop/livestock looks like or should look like. It doesn't require a high standard of literacy and combines words, pictures and music.

A person typically retains about 10% of the information he reads, a full 20% of what he hears, but 80% of what he see, hears and discusses. This is the potential of visual and audio visual screening as a teaching tool. And if "hands on" practice or demonstrations is included, a person's retention-level can rise to a high 90%.

Some twenty-two (22) films produced by the DAL Audio-Visual Unit in English, Pidgin and Motu using hired equipment have proved highly popular. Obviously the use of audio-visual tools as an aid to extensionists should be emphasized and strengthened. But since 1996 no new video-films on Agricultural subjects have been produced. Financial constraints have limited further progress in this field.

C. RADIO COMMUNICATIONS

DAL has provided ideas, informations and staff for the formulation and production, of National Broadcasting Corporation's agricultural radio programmes. These send out simple messages on practical agriculture that can be understood even by someone who cannot read and write. The messages are received quickly, and absorbed over long distances by large groups of our people. The development of above programmes is only possible if the staff have the backing of a well run and up-to-date agricultural library with latest books, journals, research reports, handbooks, encyclopaedias, bibliographies, literature guides, directories, reviews and other publications. This, as indicated above, is presently not the case. These still popular and eagerly sought after radio programmes, in face of financial constraints, have now more or less ceased altogether. No serious attempt has been made to develop home grown agricultural programmes, not even backyard gardening information for featureing on EMTV.

D. PUBLICATIONS

These are the single most important sources of information by which research-extension-farmer linkage in agricultural sector is maintained. For the continuity of publications, the system must ensure regular publication of results. The publications from DAL publication unit address various strata of our society and are intended for didiman, didimen, teachers, farmers, general public, extensionists, research workers, project co-ordinators, national and international organizations, experts and consultants, scientists, technologists and other professonals in schools, colleges and universities throughout Papua New Guinea. They fall into the following catagories:-

1. Extension Publications

DAL publishes a wide range of Extension Bulletins, Farming Notes, Rural Development Handbooks, Village Talks, Field Pocket Books, DAL Posters, Discussion Papers, Agricul-

ture in Economy Series and Agriculture Booklets. Also produced are extension materials such as videos, films and audio-tapes on agricultural topics and developments.

DAL produces and publish the only extension journal of developing South Pacific nations viz. HARVEST which is a widely distributed and eargerly sought after journal.

2. **Rural Newsletter**

The widely read Agricultural Newsletter, Didiman has been hailed as the best Rural Newsletter in PNG and needs to be strengthened. Currently it has ceased publication altogether due to staffing and fiscal constraints.

3. **Scientific Publications**

DAL publishes specialist scientific bulletins, technical reports, research bulletins and PNG Journal of Agriculture, Forestry and Fisheries which is the only Agricultural Journal being regularly published from the developing Pacific Island nations. This scientific journal published since 1935 has had standards and presentation which earned it an international recognition. It is a national heritage publishing articles based on research in PNG and the Pacific Island nations.

The above wide range of agricultural extension and scientific publications aimed at different levels of audience are prepared by DAL staff specializing in writing, editing, designing, typesetting. They, as recently as 1996, were distributing 10,000 publications and over 50 titles each year throughout PNG. A Reader and Listener survey in 1993 showed that there is demand for more publications to be distributed to more centres.

Current state of DAL Publications

As the former Chief Publication Officer of DAL, it is sad for me to observe that since 1997 there has been a steady and unacceptable decline in the fortunes of DAL Publication and Printing Unit. Two highly experienced national editors have left the unit and no new replacement have still been appointed. The computers for Harvest and PNGJAFF purchased in 1994, though now working erratically, have not been replaced. Telephone & fax bills are seldom paid regularly resulting in long cut offs. The printing machines have not been serviced regularly. The trust account of the unit which received "outside job money" and was used for bringing out various DAL publications, has been taken away from the unit resulting in its irregular functioning. It is no longer a scientific business enterprise it used to be from 1993-1997. It is in the interest of Agriculturists of all strata in PNG to see that the unit is revitalized by funding it normally and returning to its Trust Account for efficient day to day operations.

E. KNOWLEDGE SECTOR

According to a February 1993 issue of the Economist the fastest growing part of all rich countries is neither manufacturing nor traditional services but the "knowledge sector". The magazine noted that over half of all workers in rich countries are currently employed in the production, storage, retrieval or distribution of knowledge. New journals are being established at the rate of one day in the industrialized world. We are therefore often hood-winked by people who discourage us either from starting new journals in the world or revitalising old ones on the pretext that there are enough journals already and it is in a scientist's interest to publish in a Western Journal.

We need to wrench ourselves from the above legacy, by strengthening the old journals and establishing new high-level scientific journals worthy of the best papers from anywhere else in the world. The stocks-in-trade of scientific journals are ideas, high standard of published papers and regularity of their appearance, and we must therefore be in the market-place for journals if we are to be competing participants in this trade. Unless we are prepared to invest in the "knowledge sector' now we would find it very

difficult to catch up with the brain power of our competitors, in the 21st century. The information sector requires adequate funding and staffing. It cannot function on the wings of hopes, prayers & grandiose statements.

We must remember that knowledge can be converted into income & jobs. The role of Government is to:

a) encourage entreprenurship;
b) encourage can-do-community.

The Government has a responsibility to ensure competitiveness by creating:

a) low tax environment;
b) low inflation regime.

The above policies would generate investment both domestically and from abroad.

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AGRICULTURE MARKETING

Phil Franklin[1]

INTRODUCTION

This paper deals with Agriculture marketing, particularly at the local level.

MARKETING IS THE MAJOR WEAKNESS OF A SMALL PRODUCER

When we talk about agriculture at the local level the major weakness here, as with all SMEs (small and medium size enterprises), is in marketing. Local producers must be aware of what is involved in marketing that will add value to their commodity.

FORMAT OF PAPER

This paper shall develop by looking at the three options for local producers in PNG. All three options involve various degrees of marketing.

What choices are there? The first option is *direct exporting*. This takes time and effort, plus a lot of finance and expertise. It's high risk and easy to make losses due to unfamiliarity with regulatory requirements, etc. All marketing expenses and responsibilities fall to you as exporter. This is obviously not a real option for a small producer.

The second option is to *sell to a local buyer*. This can be done 3 ways. First it can be sold to a middleman such as an exporter (AGMARK) or to a retailer (such as Andersons). Secondly it can be sold to the Consumer at the local market. Selling to the retailer or end-user is the easiest option as payment is supposed to be quick. There is less need for marketing expenses.

The third way is to form a co-operative. There are numerous disadvantages if management is not strictly commercial. Therefore this has normally been an option developed in rural areas where there has previously been no local buyer. With this sort of organization small producers can jointly create a critical mass and sufficient economies of scale to market their product successfully. Again much depends on the co-operative entrusting management to someone with commercial competence. And then the problem arises of having enough managerial talent to carry on the business if the manager falls sick or needs to take some leave. There have been examples of successful and unsuccessful Co-operatives in PNG.

AN EXAMPLE AND A SOLUTION

Mr Farmer is a small agricultural producer. Mr Farmer's problem is that, while having a product that can compete internationally, he lacks the marketing and information infrastructure to make the leap into exporting. The costs of creating such an infrastructure are beyond Mr Farmer's resources and credit is hard to come by.

Does this sound familiar to PNG? Yes!

A SOLUTION

Governments have tried to address the marketing problems of SMEs by creating export promotion offices, establishing training institutions, etc. The South Pacific Trade Comission (SPTC), currently headed by PNG's Mrs Tuvasa, is an example of an export promotion office which *does a good job and avoids* the problem of inefficiency and incompetence.

However bodies like the South Pacific Trade

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Commission and IPA need to be supplemented by other additional efforts. The bottom line is that it costs money and there is the ever-present spectre of inefficiency and inability looming over bureaucratic offices.

A 1997 UNCTAD/WTO study titled "The SME and the Export Development Company" presents both an alternative to export promotion offices and an additional effort: this "additional effort" is for the government to encourage the growth of private sector institutions that support SME exports. The government can save money while achieving important goals in development and trade.

The key is to bring two different types of private institutions together and to help each other understand the other's requirements for a successful business relationship.

The SPTC representatives have recognised the need for this sort of business relationship and it is the core of their work. But it is not enough by itself.

CONTRIBUTION OF THE LARGE PRODUCERS

Not enough appreciation is made in this country of the contribution of the large producers to assisting agriculture to make the transition from subsistence to commercial.

Where large producers exist many of the problems of the SMEs disappear or become manageable. This is because the problems of critical mass disappear, the attraction of infrastructure and commercial skills plus the availability of a market all make the environment for the small producer more friendly.

In agriculture large producers do not compete against the small producers as both produce small quantities in PNG compared to the world market. Both are competing together against a much large world market. Both are helping each other as their separate productions are aggregated to cover shipping overheads and increase volumes overall and lower each other's marketing costs. When these large agricultural enterprises are absent then we see the many problems arise or are not solveable without the large injection of government cash.

LETS LOOK AT SUCH A SITUATION

Imagine the coconut producer outside Kerema town. Is his produce marketable compared to someone outside Madang, Kavieng or Rabaul?

No. The Kerema coconut producer has enormous problems because there is no established infrastructure or marketing network for coconuts there compared to other more developed areas. His marketing costs are enormous, perhaps even so huge as to make it uneconomic. Coconuts thus get left on the tree except what is needed for subsistence purposes.

SECRET OF MARKETING FOR SUCCESS

Marketing is an essential element in agriculture. There is an essential need to establish a brand or reputation in the agricultural field.

Coffee is a good example. Tourists and long-time residents love our Goroka coffee. That is because of effective marketing

What is the secret? The first element of success is to have a basic good product. And if the product is of a special high quality then be proud of it. Let everyone know about it with whatever level of advertising you can afford - it may just be the sign on your pick-up truck or an ad on EMTV.

The second element is to make sure that customers are only supplied the genuine product consistently. Other agricultural products need not be of a premium quality but the quality of the particular brand must be of a consistent quality.

Third element of success is the most important for PNG producers: marketing the product.

Transport logistics and commercial marketing are the two areas to marketing produce.

WHAT CAN BE DONE NOW TO IMPROVE AGRICULTURAL MARKETING?

1. Infrastructure is the key to improving

The marketing of PNG Agricultural product relies on Roads, Bridges, Power, Telecommunication and local markets.

2. Local market Development

PNG has plenty of land on which to grow food. Local markets are seen all over the country. These vary from being small informal roadside and village arrangements to large formal markets like Lae Main Market. Most of these markets are not well serviced by buildings, power or water. Additionally they close at different time with little regard or the producer *or* the consumers ability to get to the market. There needs to be a major review of local market opportunities and local market infrastructure.

IF YOU ARE A LOCAL LEVEL PRODUCER HOW CAN YOU BETTER MARKET YOUR PRODUCT?

Take a lesson from successful rural marketers and your marketing will improve. Visit your target market twice in order to:

a) determine what you have to sell - your surplus, or what you can grow or rear to sell - your possible surplus.

b) identify potential customers, the closer to your village the better.

c) ensure that the cost of your goods to the customer is below what he will buy them for.

d) Market to your customer - is your goods superior in some way in price or quality?

e) Small producers frequently don't realise how critical it is for their customers to have consistent supply and how important this is a factor in marketing. Often confidence to the buyer that you can consistently supply is the difference between being able to sell to a quality customer and not being able to sell. Fix up any factors that will affect your consistency of supply.

f) Cleanliness - at minor cost attention to cleanliness will bring rewards in higher sales. Cleanliness of anything associated with delivery and your product will also impress your customer a little extra.

In the end marketing is about enhancing your product and giving the consumer a lasting impression.

DOWNSTREAM PROCESSING OF AGRICULTURE PRODUCTS

Wayne Golding[1]

ECONOMIC FACTORS

The PNG economy can elevate itself from its current economic frustrations, by lifting Domestic Production across all economic sectors. Excess protection will have an adverse effect, whereas protection afforded as detailed in the "White Paper - Tariff Reform Program", would provide economic uplift.

Economic factors influenced by increased domestic production, to name but a few are:

- Increase in consumer spending.
- Providing economic activity to the rural and formal areas.
- Preserve and increase foreign exchange earnings.
- Increase employment.
- Reduce dependence on food imports.

A main feature of uplifting domestic production, is the downstream processing of Agricultural products, which in turn will push upstream opportunities.

The continual export of raw materials only transfers employment overseas. PNG needs to realistically look at opportunities, which are effective import substitutes, and/or offer export opportunities in a semi and fully processed state.

PRODUCT GROUPS

1. **Tree Crops:** Coffee
   Tea
   Palm Oil
   Cocoa
   Copra

2. **Minor Crops:** Vanilla
   Cardamom
   Other Spices

3. **Fruits:** Banana, etc.

4. **Root Crops:** English Potato - Processing
   Sweet Potato (Kau Kau)
   Kava
   Other Vegetables (Carrots).

5. **Grain Crops:** Corn
   Wheat
   Stock Feed Materials
   (Maize; Sorgum, etc).
   Rice

6. **Vegetables:** Tomatoes etc.

COMMERCIAL REALITY CHECK LIST

Is it competitive against imports?

Yes - Opportunities do exist.
No - How much protection can be afforded.

Is the suppiy chain adequate?

Seasonal/quantity/quality/price

Can capital investment be financially supported?

Economy of scale; Ratio of Domestic and Export Quantities; Capital vs Borrowing; Exchange Exposure.

Market Access

Domestic; Export; Customers Needs; Price Competitiveness; Consistency of supply; Export

[1] President of Chamber of Manufacturers Council, Port Moresby.

State semi to fully processed goods; Shipping Capacity; Quarantine.

THE PNG EDGE

Taking into consideration comparative and competitive advantages, PNG does have the advantage in products where raw materials are "home grown".

After reviewing the commercial reality check, I personally feel the following crops do have the most potential, subject to consistence of supply and economy of scale of production of base materials.

Palm Oil - From semi to final product.
Tea - Already there, but needs expansion
Coffee - Expansion of Roasted Coffee products, especially "NITCH" markets for high end products.
Cocoa - Opportunities exist on the surface, but best answered by industry.
Spices - High end products.
Grains - Especially for stockfeed with potential to assist future food chain.
Cottage industries
- Domestic consumption initially.

PNG DISADVANTAGED PRODUCTS

General food crops, including vegetables.

BIOSAFETY REGULATORY POLICY IN BIOTECHNOLOGY

Mohammed E. Wagih[1]

BACKGROUND

Trade liberalization under the General Agreement on Tariffs and Trade (GATT) has lead to a a process of dismantling mechanisms for tariff trade barriers such as price support, tax concessions, and export subsidies that were set to protect national industries. This increased the flow of trade among countries in diversity of products including agri-food, feed, veterinary and pharmaceutical. Competitiveness and effectiveness have become the name of the game. The recent development in biotechnology became one of the major growth industries worldwide. The industry, is likely to grow even further, promising a major source of innovation and product diversification, provided that consumers and businesses are confident in the safety of the products. Under such economic and legislative climate, competitive entry of developing countries into the biotechnology industries is fraught with many difficulties (Wagih, 1998). These difficulties may include lacking of technological and legal capacities for developing innovative biotechnology R&D, and relevant regulatory policy, inability to access new technology tools attached to inteilectual property rights and inability to secure share of benefits regenerated from existing patents and infringements of owned resources. In view of the continuing coalescence of the biotechnology industry under limited multinational companies, these difficulties seem to intensify (Goldstein 1991).

The safety issue of biotechnology practices and products, known as "**Biosafety**", is a potential non-tariff barrier to trade and, therefore, has become a central to the principles of free trade under GATT. In principle, most of the biotechnology products are of no potential harm. However, in the last two decades, the increasing appearance and commercialization of products from recombining DNA of living organisms, resulting in Genetically Modified Organisms (GMOs), has raised a flux of biosafety concerns about possible unitended consequences on human, the environment and the socio-economical status of communities. The unintended consequences of GMOs on human may include allergencity, toxicity, and mutagenicity and altered levels of nutrients or anti-nutrients and possible dietary and nutritional harm of the food in its food web. Concerns of unintended environmental damage include the potential of GMOs to become a weed or invasive to natural habitats, potential for gene escape/ flow (genetic pollution) to wild relatives whose hybrids offspring may become more weedy or more invasive, specially in Centre of Origin, potential of GMOs to cause injury, disease or damage to environmental or agricultural products through toxicants (eco-toxicants) and infectious agents, or increase susceptibility to pests, potential impact on non-target organisms, and potential impact on biodiversity. Concerns of unintended socio-economic impacts include, product substitution, changed agricultural practice, and labour displacement etc.

In this regard, the 171 member countries of the Convention of Biological Diversity (CBD) recognized the need for an international "Biosafety Protocol", as to provide legally binding instrument in biosafety (CBD 1995). At the Second CBD Conference of the Parties (COP2) in Jakarta (6-17 November 1995) the Parties passed a resolution on consideration of the need for and modalities of a protocol for the safe transfer, handling and use of LMOs (GMOs). A protocol on biosafety was thought to be necessary for trans-boundary movement of any GMO that may have an adverse effect on the conservation

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and sustainable use of biological diversity. An open-ended Ad Hoc Working Group on Biosafety under the COPs was initiated to address this matter. The Working Group met six times from 1996-1999 with a mandate to developing a framework for a Boisafety Protocol to be presented to the COPs. The First Extraordinary Conference of the Parties to CBD was convened at Cartagena, Colombia from 22-23 February 1999 to adopt a recommended text of the Biosafety Protocol. The COPs decided that the Protocol be called "**Cartagena Biosafety Protocol**". The Conference failed to reach consensus among the COPs, mainly due to differences relating to the scope of the Protocol, and the relationship of the Protocol to other international treaties. After further efforts in extraordinary meetings, the COPs in Montreal, Canada adopted the Protocol, on 29th February, 2000.

THE CARTAGENA BIOSAFETY PROTOCOL

The Cartagena Biosafety Protocol is being open for ratification by the CBD Parties since the 15 May 2000 at the 5th CBD Conference of the Parties (COP5) in Nairobi, Kenya. Signatures will then be open at the Treaty Section, Office of Legal Affairs, at the United Nations Headquarters in New York, as from 5 June 2000 to 4 June 2001. The Protocol will enter into force 90 days after minimum of 50 Parties have ratified the Protocol. The Protocol sets requirements for monitoring and reporting by countries on how they are implementing the Protocol; compliance procedures are also set up to settle disputes. There is a provision in the Protocol for providing capacity building for biosafety to help developing countries and countries with economics in transition to build up their capacity in biosafety and implementation of the Protocol. This will be pivotal to trade and will, therefore, require countries to develop their own "**National Biosafety Guidelines**" and build the necessary legal and technical capacities in biotechnology for safe transfer, handling,use and indentification of GMOs and their derivatives. The establishment of an inter-agency **National Biosafety Committee (NBC)** would be necessary to undertake the responsibility of monitoring biotechnology activities and assessing processes leading to the release of GMOs and their trade in a manner mutually supportive of other international obligations (Wagih *et al.* 1998, Wagih 1998)..

REGIONAL DEVELOPED COUNTRIES PROSPECTIVE

In July 1996, the Standing Committee on Agriculture and Resources Management (SCARM) established a Working Group to examine the need for regulation of gene technology and release of GMOs from an agricultural perspective. In August 1997, SCARM considered a report from the Working Group recommending national uniform assessment process that provides the necessary assurances to consumers and distributors of GMOs products, particularly by protecting against unwanted public health and environmental outcomes; provides a consistent regulatory approach across government and low compliance and administration costs; and control the importation of GMOs. It was proposed that a Gene Technology Agency (GTA) be established with the power to assess all activities leading to the release of GMOs and their products.

In August 1997, the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), a Council of Commonwealth and State Ministers, endorsed the framework proposed by the Working Group. The Australia New Zealand Food Authority (ANZFA) developed specific regulation for GMF in relation to human health in May 1996. The Standard appeared in Australian Food Standards Code as Standard A18. The safety assessment considers the unintended consequences that GMOs may have on other characteristics of the food. Due to public pressure in New Zealand, the Labour Party was elected to government in November 1999 with an election promise that it would hold a Royal Commission of Inquiry into genetic engineering. The inquiry was due to start in May/June 2000 and is scheduled to last for approximately

a year.

Environmental and food safety risk assessments were recommended to be contracted out, where appropriate, on a cost recovery basis from applicants, as not to overburden the national regulatory agencies.

THE BIOSAFETY ISSUE AND CONSTRAINTS IN DEVELOPING COUNTRIES

While considering the need for developing relevant National Biosafety Guidelines to safeguard the environment and public health and to protect national interests and concerns, developing countries face numbers of major constraints, among them are:

- Understanding the potential impact of GMOs and their products, including pharmaceuticals and genetically modified food and feed (GMF), upon the environment, biodiversity and human health;

- Dealing with public perception issues related to GMF, and the environmental impact of GMOs;

- Assessing possible social and economic implications of the import of GMOs and their products in light of availability of safer substitutes.

- Coping with the workload regulators are likely to face in preparing new regulatory policy and the cost of implementing relevant legislation; and

- Relying on the public sector with limited support resources as opposed to strong private-sector industry that is in support of legislation in developed countries.

CONSIDERATIONS IN DEVELOPING NATIONAL BIOSAFETY GUIDELINES

The development of National Biosafety Guidelines in biotechnology is based on the same global, regional and bilateral considerations that were taken into account during the development of Cartagena Biosafety Protocol. These considerations may intervene with or pressurize national interests in the course of optimizing a national framework for regulatory policy. Some of these considerations are:

- **The implications of World Trade Agreements (GATT), specially provisions concerning non-tariff trade barriers**

The principles of free trade set at the final round of the GATT (Raworth & Reif 1995a) that was completed in Marrakech in 1993 is administered by the World Trade Organization (WTO), which became responsible for undertaking GATT obligations in the discrimination between justified non-tariff trade barriers, i.e. for reasons of environmental prudence and/or adverse effect on human health, and restrictions that are unjustified under the principles of GATT. In this respect, the World Trade Agreements (WTAs) serve as a *de facto* means for harmonizing biosafety legislation and decisions through curtailing national sovereignty to rule unilaterally on new GMOs and their products under the principles of free trade. Evidently, the implication of GATT compromises the sovereignty of individual nations, where its biosafety legislation might be construed as a spurious non-tariff trade barrier. In other words, the requirement is that national biosafety measures adopted for reasons of environmental protection are 'legitimate' and 'scientifically justifiable'. In case where national provisions deviate from international guidelines, a country must, if challenged, produce scientific evidence justifying such deviation.

Under GATT, the potential Technical Barriers to Trade (TBT) were addressed in two agreements reflecting environmental biosafety issues, relying upon a range of international standards and guidelines. These agreements are: the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT);

The SPS Agreement requires members to base their sanitary or phytosanitary measures

on international standards, guidelines or recommendations, where they exist. But, an option is available under Article 5.7, which allows adoption of provisional measures "*Members may introduce measures, which result in a higher level of protection than would be achieved by SPS measures, if there is a scientific justification.*" (Paragraph 9). Substantial evidence is not a condition for applying restriction on imported GMOs or their products. Least-develop member countries were given till this year, 2000, to implement SPS obligations. Otherwise, a member country might apply the restriction with some evidence, and within a reasonable time, the member must provide additional evidence to justify further restriction. However, providing adequate scientific justification in a reasonable duration would be a problem case when risk is uncertain, impossible, or cannot be identified. This could mean that an embargo on an import of GMO or its products, based on provisions of the Biosafety Protocol, by one country is likely to bring trade disputes to the WTO. For this reason, the appropriateness of the 'Biosafety Protocol' has been challenged on the basic of its possible conflict with the GATT principle of free trade (Miller *et al.* 1998).

The TBT Agreement requires that "*Members shall ensure that technical regulations are not prepared, adopted or applied with a view to, or with the effect of creating unnecessary obstacles to international trade*" (Raworth & Reif1995b). However, the Agreement does itemize particular 'legitimate objectives', according to which trade restrictions may be permitted. These objectives include exceptions, which were also made in Article XX of the GATT. Obstacles to trade based on the National Biosafety Guidelines may not be considered necessary or legitimate under TBT. Obviously this is of a potential conflict of interest between principal exporters of biotechnology products (mainly developed countries), and developing countries. Therefore, many developing counties consistently supported the need for a protocol to cover, not just the transboundary transfer of GMOs, but also their post entry safe handling and use. In the course of biosafety risk assessment and risk management, developing countries anticipate commitment from developed countries for more modest capacity building in biosafety.

Socio and economic issues have little scope in the GATT. In Article 5.3 of the SPS, there is a little consideration for economic factors, but a restriction must be least-trade restrictive. The fact that there is no explicit provision under GATT for excluding an import on the basis of the possible social or economic ramifications, socio-economic factors may be considered at a national level may serve as legitimate restrictive reason, at least for now. However, the acceptance of GMOs imports remains obligatory. In Italy, for example, Bt-maize (GMO) was banned from cultivation; however, seeds were imported into the country. It was argued that the arrangement infringes national sovereignty and disregard the wishes of the public majority. Nevertheless, in cases when the public votes in favour of a proposed ban, the country itself will finally fall in a direct conflict with WTO obligations. Despite the possible conflict with WTO, socio-economic, ethical and public demands have come out clearly in the biosafety guidelines in many countries around the world including the Scandinavian countries, Switzerland and Italy. The fact that the environmental impact assessment and the risks associated with release of a GMO vary between ecosystems may explain why the socio-economic impact varies widely between countries. Also, the socio-economic benefits assume a different weighting to developing countries and the implications will evidently depend upon a plethora of local factors. Therefore, experiences of environmental releases in industrialized countries are not transferable, *in toto*, to non-industrialized countries, where different environmental conditions prevail. This emphasizes that the interest of developing countries in a mechanism for the regulation of GMOs and their products may not be best served by a straight forward assimilation of regulatory models taken from industrialized nations. A provision is made under Article 8 and 13 of the Cartagina Biosafety Protocol, that Parties in reaching a decision on the import of LMOs may take into account the social and

economic implications of adverse impacts on the conservation and sustainable use of biological diversity.

- **The commitment to the 'Cartagina Biosafety Protocol', which will be open for ratification by Parties that have previously ratified the CBD.**

The provision of Article 19.3 of the CBD for member countries to consider a legally binding international biosafety protocol is about to be materialized. The proposed Biosafety Protocol specifies obligations for international transfer of LMOs/GMOs and sets out means for risk assessment and risk management, technology transfer and capacity building.

Whilst developed countries realizing the importance of regulatory convergence amongst trading partners, they remained concerned that any international "Biosafety Protocol" would adversely affect their biotechnology exports. The United States (US) and the World Bank, for example rejected the need for such protocol. Although the US has not ratified the CBD, and, therefore, not a party to the 'Biosafety Protocol', it continues to participate in the negotiations, both directly (Report 1998; Hoyle 1997), and by advising countries receiving US aid on the deliberations of the Conference of the Parties.

Advance Informed Agreement (AIA) is a provision, which was made central to the Biosafety Protocol. It offers mechanisms by which exporters of GMOs or their products inform the competent authority in the importing country prior to export, as to allow the importing countries informed decision making prior to importation of such commodities, which may raise concerns regarding the effect on conservation and sustainability use of biodiversity. Because of the reduced capacity and resources of developing countries or biosafety risk assessment and risk management, the AIA offers the only affordable negotiating power in the trade of GMOs and their products. In the absence of risk assessment, member countries are prohibited from applying permanent restrictions on GMOs and their products.

Liability and compensation: If GMOs have the potential to cause serious environmental damage or pose an unanticipated public health risk, the issue of liability becomes important. In the negotiations for the Cartagina Biosafety Protocol, it has been suggested that there should be a requirement for liability and compensation as part of the AIA process. For a more far-reaching protocol, which would include provisions for consideration of the liability and compensation following environmental damage, an African proposal was tabled at a meeting of the Open-Ended Ad Hoc Working Group on Biosafety as late as 1997 (Masood 1997). This was met with the opposition of both the European Union and the US (Report 1997). However, in AIA procedures, a commitment to fault-based, civil liability would conceivably be commensurate with risk posed by GMOs. In the absence of evidence for a negative outcome from a GMO release, requirements for public liability, care or mandatory compensation may not be satisfied under the SPS requirement (Wagih 1998)

Labeling of foods driven from GMOs (GMF): An International standard for GMO labeling is in preparation under the Codex (Codex 1998). In the absence of a Codex standard, the TBT Agreement permits mandatory labeling. This is referred to as incorporation of Process and Production Methods (PPMs), i.e. LMOs that are intended for direct use as food or feed, or for processing, and not intended for introduction into the environment, would be identified as *"may contain"* LMOs. Labeling for unincorporated PPMs may only be introduced on a voluntary basis, and then only under guidelines specified in the TBT Agreement. Mandatory labeling for unincorporated PPMs (known as negative labeling) is prohibited. Article 18 of the Cartagena Biosafety Protocol requires Parties to take a decision on the unique identification, no later than two years after the entry into force of the Protocol. The criteria used to determine that foods are not familiar or substantially different as a result of genetic modification are important

to justify an exclusion decision, however, will depend on what normative standards were used. Opponents of mandatory GMO/GMF labeling maintain that the consumers should not be *bothered* with unnecessary labeling and the regulators and manufacturers should not be unnecessarily over burdened (Codex 1998). May be against the Codex standards, the European Parliament has adopted GMO-labeling requirements under Council Directive 90/220/EEC, and under legislation for products of GMF soybeans and maize. The EU requires mandatory labeling for GMFs and foods that may contain GMOs (EC 1997). In comparison, the United States only requires labeling of GMF that are unfamiliar and/or substantially different from the unmodified counterpart (FDA 1995).

Trade bans against non-Parties to the Biosafety Protocol: Trade bans was proposed, against non-Parties to the CBD. However, it was argued this would penalize countries not taking part in the protocol. Under the principles of GATT, the most favoured nation and national treatment principles (Article I and III of the GATT) would be breached by such a ban, unless the mandated measures under a multilateral agreement fulfilled the terms of the GATT Exception clause (Article XX). However, a more WTO-consistent provision would be one that permitted trade with exporting interests prepared to enter into AIA procedures, or trade with non-Parties who had legislation consistent with the spirit of the Biosafety Protocol.

- **Pressure under regional trade agreements towards harmonization of biosafety regulations, such as that under APEC, EU, NAFTA etc.**

All 132 members of the WTO are also members of some form of regional trade agreement (WTO 1997), such as Asia Pacific Economic Co-operation (APEC), European Union (EU), North American Free Trade Agreement (NAFTA) etc. Membership of 'free trade areas' (or aspiration to membership) may place certain constraints upon the national biosefty legislation, due to the need for harmonization in the presence of large differences among the biotechnology capacities of member countries. Regardless of being a member of a trade agreement, the geographical proximity of some economies leads to ecological similarities, which may be reflected in their biosafety provisions. For example, in the APEC, Malaysia has adopted guidelines, which most closely follow the Australian model, although not a member of the Association of South-East Asian nations (ASEAN) (Hamid, Z.A., Personal Communication). It is a fact that, regulations cannot avoid judgement about strategic advantages or disadvantages of a product; presumed benefits may influence how regulators define harm. Thus, an implicit technology assessment enters their safety judgement.

- **Pressure from multinational biotechnology companies to introduce biosafety regulations prior to local investment.**

It is an imperative for multinational companies that a country has biosafety regulatory policy or guidelines in place prior to investing or experimental introduction of transgenic organisms in such country. This arises partly, from an anxiety to minimize the risk of liability in the event of environmental or human health problems arising from the release, and partly from a concern to avert potential criticism from public interest groups that the company is exploiting a lack of regulation in choosing to develop their products in these countries. There is recognition that where existing legislation cannot be easily adopted to cover biotechnology, multinational companies are anxious to see a new legislation *per se* been introduced, irrespective of the system from which it is drawn.

- **Pressure from foreign aid agencies to introduce biosafety regulations under 'Aid for Regulation' deals.**

The development of national biosafety legislation, in some cases, may become a prerequisite for bilateral aid. The US Agency for International Development (USAID) requires the introduction of regulatory measures by developing countries prior to condition for aid for biotechnology capac-

ity building. The tying of bilateral aid packages to the development of biosafety regulations necessarily amounts to the transfer of legislative approaches from donor to recipient countries. An USAID sponsored project in Egypt provides a good example. A binding code of conduct for biosafety in Egypt, approved in 1995, was developed by the Egyptian Agricultural Genetic Research Institute (AGERI) specially to facilitate bilateral research projects (Madkour, M., personal communication). However, although this code of conduct was produced with the collaboration of representatives from the USAID funded Agricultural Biotechnology for Sustainable Productivity (ABSP) Project, it does not closely follow a US model.

- Confusion caused by deregulation/relaxation of regulation in some leading countries, such as the USA

Recently, there has been a relaxation of legislation (deregulation) in the US, which may be followed by other countries. This relaxations reflected in the strengthening of a 'notification system' rather than a 'permit system' for interstate movement or field-testing of particular GMO, with a provision for extension of a list of exempts from full regulatory control through petition. Presently, researchers need simply to notify the USDA Animal and Plant Health Inspection Services (APHIS) of their intention to move the GMOs, or to conduct a field test. The deregulation will generate potential problems, as hybrids from deregulated GMOs and their products will not be officially recognized as genetically modified. Developing countries and the EU do not favour deregulation, because it neglects the perception of risk and the possible social and economic harm of the new products.

CONCLUDING REMARKS

After the GATT, governments are under pressure to manage trade in agricultural commodities for maximum comparative advantage. The interests and concerns of developed and developing countries over the development and introduction of GMOs and their products vary greatly. Developing countries, which are currently lacking biosafety regulatory policy, need to understand the implications of ratification of the 'Cartagina Biosafety Protocol' and need to adopt national biosafety guidelines/framework in biotechnology, as to harness the promise of biotechnology without restricting trade. Developing of an inter-agency National Biosafety Committee (NBC) to assist in developing and implementing such guidelines, assess risk and deal with relevant issues is important (Wagih, *et al.* 1998).

In the process of developing such guidelines in a manner that protects national interest and concerns, policy makers are reminded to avoid direct assimilation of biosafety frameworks developed in industrialized countries, and to observe the various global, regional and bilateral considerations that may intervene with or pressurize national interests and compromise national sovereignty. Trade impediments based on socio-economic consideration contained in national biosafety regulation are likely to be challenged.

In order to formulate realistic national biosafety guidelines, and for the effective safe transfer, handling, use and identifying biotechnology products, especially GMOs and their derivatives, developing countries need to, seriously, consider; 1. Develop relevant legal and administrative frameworks for biotechnology, 2. Acquire scientific and technical training and institutional capacity in biotechnology with the ability to provide scientific justification in the decision making, and 3. Develop strategies for the training of biotechnologists in relevant policy issues to assist in the harmonization of guidelines at sub-regional, regional, and international levels, and in monitoring the implementation of the Cartagina Biosafety Protocol.

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ROSPECTS FOR PALM OIL INDUSTRY

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FACTS AND CONSIDERATIONS

Background

apua New Guinea's oil palm industry began m very humble beginnings since its observa- n plantings in the 1920s. Following World ank's 1964 recommendation for diversifying e economy, the first commercial plantings of l palm in Hoskins commenced in 1967. The dustry comprises of two distinct but adjacent mponents, the estate and smallholder ubsectors.

ne approach adopted was that of nucleus es- te-smallholder (NES) development. The plan- tion companies were to supply 50% of the utput, and provide full milling, marketing, tech- cal services and management for the estate nd associated smallholders. Smallholder cheme was managed by the Government's epartment of Agriculture and Livestock (DAL) supply fruit to the nucleus estate operated ills.

here are now five projects in Papua New Guinea. he first of these was in Hoskins area of West ew Britain Province. Plantation development ommenced in 1967.

irst smallholder settlers were brought from ther provinces to settle on a 6.5 hectare block ach of government land, 4 hectares for oil palm lanting and 2.5 hectares for food gardens, given n a 99-year lease. The Village Oil Palm (VOP) lanting was also developed under the Clan and Use Agreements (CLUA) to facilitate the rower credit from the Rural Development Bank, ith initial financing from the World Bank.

The industry has grown from strength to strength, with three major projects in Hoskins, Bialla, Popondetta and the two smaller projects in New Ireland and Milne Bay provinces.

All big projects operate NES schemes with Land Settlement Schemes (LSS) and Village Oil Palm (VOP) outgrowers, while the smaller projects mainly involve estates with VOPs.

2. Area

Industry covers over 80,000 hectares comprising of about 33,000 hectares by smallholders and the balance under the estates. Developments are still continuing in both sectors through new developments and replanting.

Oil Palm Hectarage in 1998

Project	Estate	Smallholder	Total
Hoskins	18,688	11,180	29,868
Bialla	6,144	9,279	15,523
Popondetta	7,718	9,931	17,649
Milne Bay	6,588	1,060	7,648
New Ireland	4,582	975	5,557
Total	**43,720**	**32,425**	**76,145**

The interest for the expansion of oil palm growing in other parts of the country is fairly high, especially developing village land. Total hectares under crop would increase from the medium to long term.

3. Production

The 1999 Estates production accounts for about 70% of output with the rest by smallholders (30%). Palm products are steadily increasing,

Chairman, Oil Palm Industry Corporation, Kavieng.

with crude palm oil exports rising from about 110,200 tonnes in 1988 to over 200,900 tonnes in 1999 (BPNG Sept. Qtr. Report). Palm kernel exports rose from 18,000 tonnes to over 30,000 tonnes in the same period.

Oil Palm FFB Production in 1999 (tonnes)

Project	Estate	Smallholder	Total
Hoskins	410,946	201,006	611,955
Bialla	62,018	100,007	162,024
Popondetta	135,349	99,888	235,236
Milne Bay	138,074	9,295	147,369
New Ireland	83,025	5,190	88,215
Total	**829,414**	**415,385**	**1,244,799**

Smallholder production was declining with a peak of 285,000 fresh fruit bunches (FFB) in 1985/86 and remained low until about 1995/96. This was due mainly to the change of management from Department of Agriculture and Livestock managed smallholder extension service to the Oil Palm Industry Corporation (OPIC). However FFB production has since increased to over 400,000 tonnes in 1999.

4. Exports/Earnings

Industry maintained consistent growth in exports of palm products in 1999 with most sales to Europe. Over 200,900 tonnes of Crude Palm Oil (CPO) was exported in that period (BPNG Sept. Qtr. Report). Earnings continued to rise from K39.3 million in 1988 to over K275.6 million in 1999 (BPNG Sept. Qtr. Report).

As a result, it now accounts for over 30% percent of total agricultural export earnings and boasts of being the second largest agricultural export earner after coffee.

5. Prices

After being in the slump from 1988 to 1993, fluctuating between K291 and K377 per tonne (c.i.f.), palm oil prices rose to K1,368 per tonne in 1998 and slightly fell to K1,113 per tonne as at September 1999 (BPNG Sept. Qtr. Report). Price forecasts for the rest of this year and to the year 2003 remain favourable subjected to developments in the major palm oil producing countries and other vegetable oil substitutes.

Prices on the fresh fruit bunches (FFB) are determined by a formula which has been reviewed several times, the latest being in 1998. These reviews are vital to ensure both the farmers and milling companies receive equitable prices. The latest review has been forwarded to the government's Commodity Working Group (CWG) for adoption.

6. Employment

Singnificant employment is provided by the industry, both direct and indirect, for many Papua New Guineans in the project areas. An estimated 100,000 people benefit from the industry including those in the service sectors.

There is potential to create more employment opportunities in the industry as the interest is high in many other parts of the country to grow the crop.

7. Research

The PNG Oil Palm Research Association Inc. is a non-profit research association financed by levy and external sources. The crop levy is K2.07/tonne ffb from plantations and K0.56/tonne ffb from growers. Current external revenue sources are the World Bank, European Union and GoPNG.

The industry under its Oil Palm Research Association (OPRA) based in Dami, WNBP, runs very reputable research programs. Some of the outstanding achievements include the development of the pollinating weevil, a milestone in the industry. It has contributed in saving huge labour costs from hand pollination of the palms and significant increases in industry output.

Also, the function of OPRA in the industry is

very important as it serves the role of developing new technologies and coordinatig with estate and OPIC (smallholder) to adopt new and proven technologies through its research efforts.

B. SMALLHOLDER SUB-SECTOR

Under the initial agreements between the Government and the foreign companies to develop the industry, smallholders would grow oil palm and supply mills operated by companies for conversion into palm products. As such the smallholder sector plays a very vital role in supplying palm fresh fruit bunches (FFB) to the estate operated mills.

1. Oil Palm Industry Corporation

The OPIC was formally established in 1992 under the OPIC Act, by Parliament as a Statutory Organisation. Its primary function being the provision of efficient oil palm extension services to the smallholders engaged in growing the crop in the five project areas throughout the country.

The Government's objective in corporatising the industry was to transfer industry management responsibilities to the respective industries. This policy was developed in direct response to its concern over the declining smallholder treecrop productivity in 1980s. It was also aimed at making the individual industry management accountable to the key stakeholders in their respective industries.

OPIC is presently financed by levy and external sources. A crop levy by smallholder of K3.50/ tonne FFB is matched by kina to kina contribution from the milling companies.

External source fundings are from the World Bank and European Union. The GoPNG has not funded for 1999 and 2000.

1.1 Overview of OPIC's Situation

OPIC has a fairly difficult and complex task to perform and its operations are spread widely throughout Papua New Guinea in areas which have poor infrastructural development. It operates within an industry set to become one of the highest export earners in PNG and in which there are many stakeholders, each with differing objectives and agendas, and within a socio-economic context, which is constantly changing and can present extreme difficulties.

Although it is a statutory body, OPIC is still a part of, and has to operate within the government bureaucracy, which in general is slow to respond to changes and is severely short of funds. It has a responsibility for the economic and social well-being of thousands of smallholder farmers and their dependents who are relatively uneducated, culturally diverse, lacking in self-reliance and who contribute minimally to the Corporation's operating expenses. It is now faced with no funding from the Government and a reduction in aid support.

1.2 Socio-Economic Context

Oil Palm production in Papua New Guinea is at a point where it is about to become the country's premier export crop, expected to outstrip the production and export of coffee by year 2001.

LSS smallholder production is higher than VOP due to socio-economic factors. However LSS production has been subject to interruption in some projects due to land disputes. Some areas have also experienced severe law and order problems due to factors associated with the resettlement of people from other regions of the country and the lack of alternative employment opportunities for settler youth.

The structure of the industry comprises the producing companies which have formed the Palm Oil Producers Association (POPA), the smallholders represented by the project area Growers Associations, a research body, the Oil Palm Research Association (OPRA) and OPIC.

All groups are represented within OPIC either by Board membership or through Local Planning Committees (LPC) established under the ACT

to assist the work of OPIC at project level. OPRA works independently of OPIC, although close relationships are maintained. This is in contrast to the Coffee Industry Corporation (CIC) in which coffee research and extension are combined under one body.

A small percentage of smallholders have diversified into other income-earning activities such as poultry and pig farming, tucker box operation, vehicle hire etc. However, there are relatively few other tree crops which can be grown in conjunction with oil palm.

Each project area experiences similar social and cultural problems which can seriously disrupt production and expansion. The West New Britain and Oro projects for example have suffered due to land disputes between settlers and the indigenous population, and also experience breakdowns in law and order due to the lack of alternative employment opportunities for settler youth. In Milne Bay and New Ireland, problems such as these do exist, albeit not on the same scale due to the absence of LSS smallholders in these areas.

In Oro Province, a major expansion of the area under smallholder produciton is funded by the World Bank, funds for which are under the control of OPIC. This US$26 million project which was due to be completed at the end of 1999, however was extended for another two year term, includes the funding of OPIC infrastructure and staffing, the construction of roads, schools and aid posts, and the financing of loans to new smallholders.

1.3 Financial Performance

Given the general economic climate and cut backs to government expenditure, OPIC has fared well financially relative to line governent departments. OPIC's stewardship of its resources has been conservative, partly because of uncertainties concerning future funding. Given the uncertain availability of future funding, the Secretariat is understandably cautious about where expenditure is to be committed.

OPIC expenditure (excluding capital expenditure) per tonne of smallholder FFB averaged over all projects in the years 1993 to 1999 remained fairly constant at between K11 and K12. The cost per tonne in mature projects reduced in this period due to higher levels of productivity, while that in development projects remains higher due to the immaturity of palm trees.

Employee remuneration costs, averaging 50% of total expenditure represent the major expense, while remuneration cost per tonne has increased, largely due to the low yields in developing projects.

C. CONSTRAINTS

The OPIC has developed its Five-Year Strategic and Business Plan, 1999-2003, to effectively implement its programs and realise its vision, mission, and functions.

However, the OPIC will only realise its goals provided it is equipped with adequate level of resources. The major salient constraints and issues affectng the industry development are:-

Road construction and maintenance in the oil palm project areas are lacking; some roads have deteriorated so badly due to years of neglect. The industry is poised to bring more benefits to the economy but good roads are an essential condition for industry's progress.

Future financial base of the OPIC is very uncertain as there was no Governement Funding Support for 1999 and 2000, although it is providing the most essential farmer services to those in the industry.

An analysis of the internal and external environment affecting OPICs' operations and performance are:

Internal

- OPIC is still subject to Public Service restrictions
- Public Service mentality still prevails but is

changing
- Future funding is of serious concern
- Manpower levels are reasonable but there is a need for additional non-agricultural expertise
- Non-technical expertise needs bolstering
- Employee motivational levels are low
- OPIC offices are generally well-equipped
- Disciplinary standards are improving

External

- Good relationships with other stakeholders are critical
- LPCs' are not as effective as they should be
- Attitudes of milling companies and management vary
- The relationship with OPRA is crucial
- FFB transport is a major concern
- Poor road maintenance hampers productivity
- Law and order problems are extreme in some areas
- Lands issues are difficult to resolve
- The pricing formula and methods of payment need examination
- Welfare of smallholders has been neglected
- Smallholder credit facilities provided by the Rural Development Bank are poor.

D. FUTURE PROSPECTS

- Primary target - increasing smallholder productivity;
- Reduced high cost structure through increased efficiency;
- Expansions in progress in most areas;
- Investment in new projects, eg., Ramu Valley;
- Considerable emphasis on environmental responsibility;
- The only effective, stable and growing rural development in PNG?

E. WORLD PRODUCTION OF PALM OIL

Market

Over the past 50 years the market for vegetable oils has expanded at a very rapid rate.

As developing countries increase their level of disposable income one of the positive indicators is the increase in the consumption of vegetable oils.

Palm oil is re-imported back into PNG as a cooking oil or as a fat for frying and bakery use. All palm oil produced in PNG is exported in the crude oil form.

The long term future for vegetable oils and palm oil in particular is seen to be extremely good. Long term oil consumption forecasts show an ever increasing consumption per capita.

Papua New Guinea

Production of oil palm on a per hectarage basis shows that PNG plantations produce oil palm equal to and often greater than the big producers Malaysia and Indonesia. PNG has a plant breeding program at Dami, WNB that produces the highest quality oil palm seedlings for the domestic and export markets.

Many areas of PNG have the potential to grow oil palm to the highest level of efficiency. Soil, rainfall, sunlight hours, terrain all falling well within the accepted criteria.

Smallholder oil palm grower: Oil palm is a good crop for the smallholder as it does not have the disciplined spraying programmes that coffee or cocoa need. The oil palm is relatively free of most insect pests and diseases when compared to coffee and cocoa.

All smallholder produced crop in processed by company owned oil palm mills. The grower has only to harvest at the proper time and in most instances the fruit is taken from the farm to oil palm mill by company owned transport.

CURRENT STATUS AND PROSPECTS FOR COFFEE INDUSTRY IN THE NEW MILLENIUM

Pugma Kopi[1]

BACKGROUND

1.1 Coffee in Agriculture and the Economy

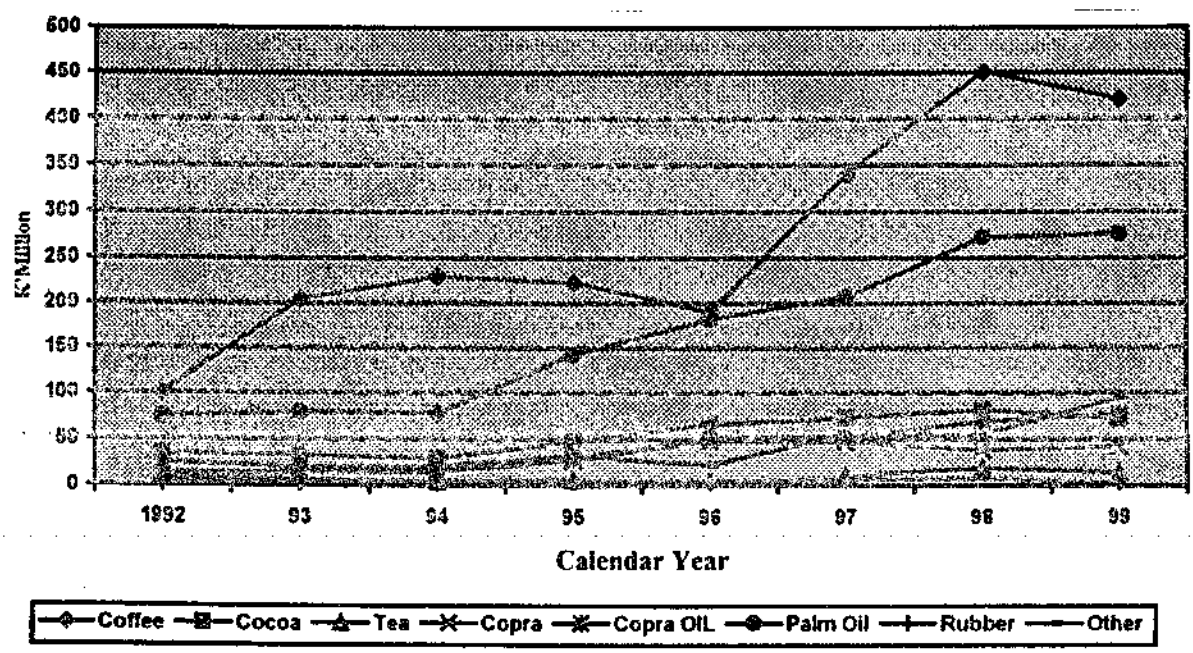
Between 1992 and 1998, earnings from coffee accounted for over 41 percent of total agricultural export earnings (Figure 1), 12% of total exports including minerals, and 5% of PNG's Gross Domestic Product (GDP).

About 2.0 million people (i.e. half of PNGs population) depended on coffee as their major source of cash income, and an important part of PNG culture and business, particularly in major producing provinces. The industry has important linkages with other sectors of the economy and is also a net foreign exchange earner.

Over 85 percent of coffee exported every year is produced by smallholders who use very little cash inputs. It is unquestionably, the major agricultural export earner, a main source of cash income and creates employment for a significant number of people.

Coffee is a renewable resource. It was here well before the mineral and oil boom, and will be here when mineral and oils are gone together with their proceeds.

Figure 1. **Total PNG agricultural export earnings between 1992 & 1998.**



Source: Bank of PNG and CIC

[1] Board Chairman, Coffee Industry Corporation Ltd., Goroka, Eastern Highlands Province.

1.2 Coffee Industry Corporation

The industry regulatory body was first established as a Coffee Marketing Board in 1964, and later Coffee Industry Board (CIB). With the amalgamation of Research and Extension, Coffee Industry Corporation was established in 1992 under the company's Act and comprised of four divisions;

1. Industry Affairs
2. Corporate Services
3. Coffee Research Institute, and
4. Extension Services Division.

The Industry Affairs takes over the function of the CIB and is mainly involved in market promotion, economic studies, export and quality control, monitoring of prices and marketing margins, export and processing licensing. Corporate Services is responsible for the efficient and effective management of the Corporation's finance and personnel administration, while Research and Extension takes over the functions of conducting applied coffee research and providing extension services respectively.

1.2.1 Mission Statements of the Corporation are;

- Maximise financial returns to all coffee producers, and
- Contribute to the Government's economic and social goals

As a member of PNG Chapter of Transparency International and its determination to ensure profits by all from lessons of past, the CIC's standard watch words governing its operations are;

- Prudence in the Spending of Resources
- Transparency in all undertakings
- Objectivity in all plans and strategies

1.2.2 Main Objectives

The objectives of the Corporation's Corporate Plan 1998 - 2002 are to;

1. Enhance the size and quality of coffee
2. Enhance the efficiency and sustainability of Coffee Industry
3. Minimize incidence of pests and diseases
4. Represent PNG in World Coffee Trade to ensure the legality, fairness and positive relationship rules at all times
5. Promote interest in coffee growing as part of a secure and a rewarding activity, particularly amongst women and youths
6. Enhance the financial returns to growers by encouraging competition and seeking new market opportunities
7. Facilitate the effective involvement of all industry sectors in the management and control of the industry.

2. CURRENT TRENDS AND DEVELOPMENT

2.1 Production and Exports

Over 95% of production is washed mild arabica coffee while the remaining 5% is washed robusta produced mainly in the East Sepik and Madang provinces. Arabica is high altitude crop while robusta grows well on lowland areas.

Smallholder sector is the industry's "back-bone", accounting for about 70% of annual production, followed by Plantations (20%) and Blocks (10%). They are also the most efficient producers in terms of cash cost (estimated at about K127/tonne in 1993). Yields are estimated at 700 kilograms green bean/hectare. This is considered high when due to the fact that maintenance is minimal and application of fertilizer and other yield-enhancing inputs is nil or negligible.

Plantations and Blocks are high-cost producers and responsible for the PNG's reputation as producer of high quality mild arabica coffee. Their costs in 1997 were around at K3,411/tonne, which can only be profitable at prices above costs. Trend in production and export are depicted in Figure 2. Smallholder production is increasing while largeholder production is either stagnant or declining.

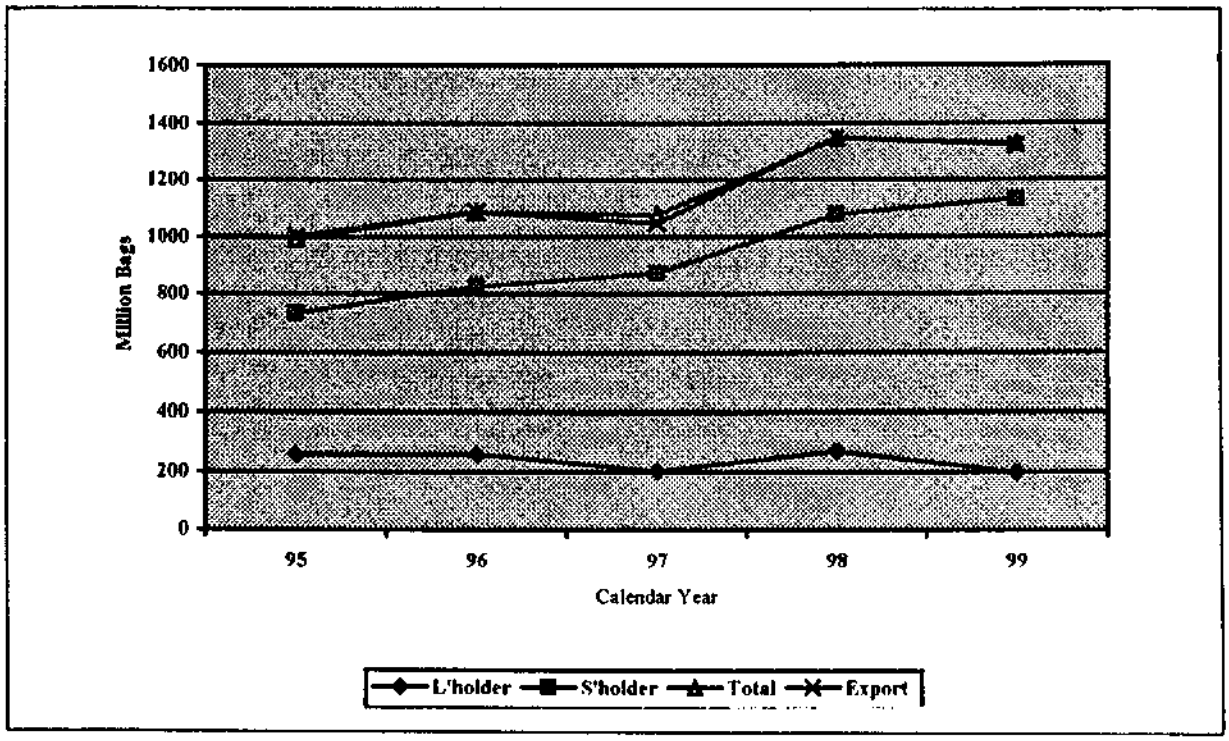


Figure 2. **Production & Exports: 1995 - 1999**

2.2 Volume & Value of Exports

Coffee exported from PNG averaged 1,050,000 bags (63,000 tonnes) over the past 8 years. Export earnings have averaged K138 million during the same period. In 1998, exports of 1.3 million bags earning over K451 million. In 1999 total green bean coffee exported is 1,320,000 bags valued at K421 million. Figure 3. Shows the value of export earnings from coffee over last six years. From a low of K190 million in 1996, it has increased significantly to over K451 million in 1998, and declined to K421 million in 1999. The decline in value is a result of declining production.

2.3 Prices

Free-on-board prices of green bean coffee over the last 11 years have shown that from 1989, price started declining and reached all time low of about K1,000/tonne in 1992. Since then, prices improved and reached K3,700/tonne in 1995 but fell again in 1996 to K2900/tonne. From 1997, prices improved significantly to reach a record high of K5,582/tonne in 1998.

Two main explanations for the significant increase are: depreciation of the kina following the floating of kina, and increase in international prices.

2.4 Stabilization Fund.

Following the depressed world market prices for extended period, the Government stepped in with Price Support Scheme. Total loan reached K140.7 million of which a significant component was repaid to the Government. The remaining balance of K52,416,671 from Stabex fund was converted to grant in February 1999.

The Board re-established the fund and it totalled **K20.5** million at the end of January 2000.

2.5 Expansion Programme - MOA with Provincial Governments

In its efforts to increase production and expand

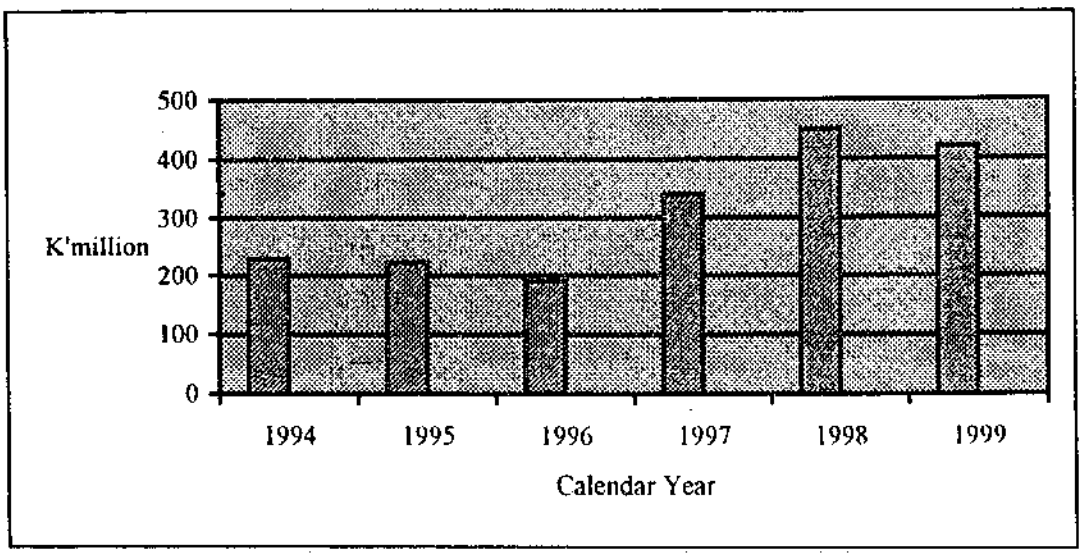


Figure 3. **Value of Coffee Exports (K'million); 1994 - 1999**

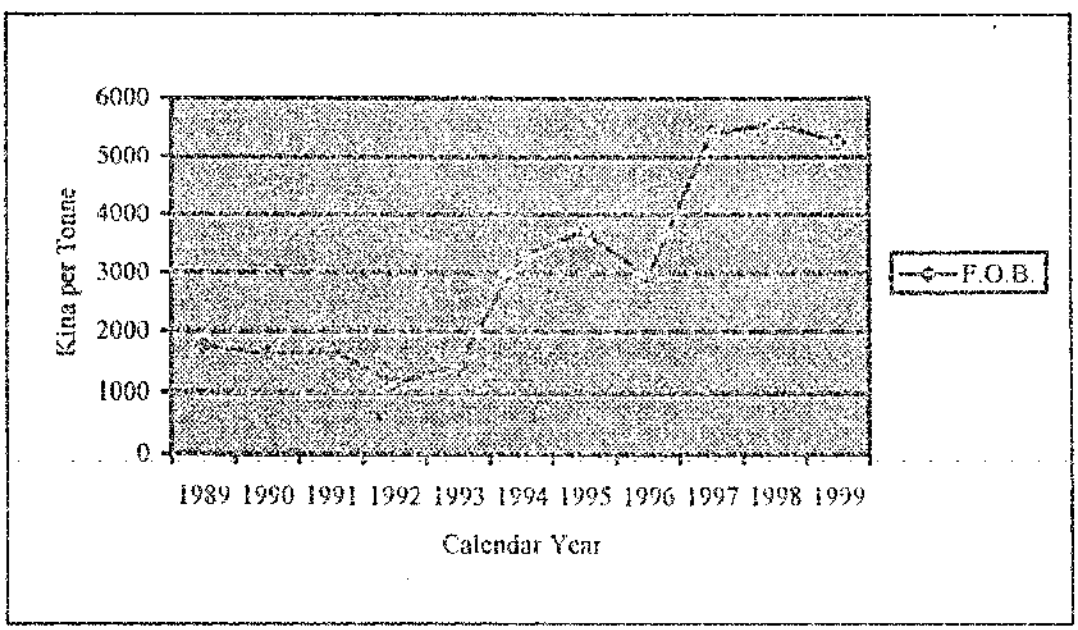


Figure 4. **F.OB. Coffee Prices; 1989 - 1994**

coffee growing into regions and provinces with potential, the Corporation signed a number of MOAs with Provincial Governors and individual MPs. Those already signed include: Southern Highlands, Enga, New Ireland, East New Britain, Milne Bay, and Member for Komo Magarima for his electorate.

2.6 Coffee Nursery

The Corporation establishes coffee nurseries in central locations around the counry to supply planting materials to farmers. These planting materials are subsidized by the Corporation to assist growers to have easy access to planting materials at reduced prices.

2.7 Coffee Credit Scheme

A total of K1,176,593 was approved and funded for over 1,491.07 hectares of coffee - mainly for smallholder rehabilitation and wet factories. Total repayment is K223,752.57 and this goes back into the revolving fund for further lending.

2.8 Freight Subsidy Scheme

Freight subsidy is an initiative of CIC with initial funding of K400,000 in 1999. Up to 40% of the cost of air freight is paid for by the CIC, while the remaining 60% is paid for by the growers.

Preliminary estimates shows that from K250,000 spent on freight subsidy in 1999, the industry earned more than K1.3 million. Given this success, K400,000 is being budgeted for 2000.

2.9 Promotion

Papua New Guinea Chairs the ICO Commiittee on promotion, particularly in Russia, Japan, China, and other Asian Countries. Our promotional activities in the last two years were undertaken with funding from the European Union. Promotion of PNG **Niugini Village Premium Coffee (NVPC)** was well received in Japan following successful trade show in late 1999. Already a container of NVPC coffee was exported to one of the big roasters in Japan.

3. STRATEGIES FOR SUSTAINABLE COFFEE DEVELOPMENT

From the year 2000 to 2004, the Corporation will give high priority to the following strategies;

- Establish strong linkges between farmer/ extension/research and to remove competition for scarce resources;
- Continue with its restructure an rationalization programme to make the Corporation leaner, efficient, productive and cost effective;
- Improve smallholder coffee production and quality through the provision of subsidized pulpers, mini-credits and freight subsidies;
- Approach the government to review import duties on all agricultural inputs. There are practical problems associated with implementing VAT at the smallholder producer's level. Tax credit in terms of coffee pricing will have difficulty in implementing;
- Improve quality of PNG coffee to obtain premium prices;
- Strengthen traditional markets and aggressively promote into new markets for PNG coffee;
- Closely monitor price and marketing margins to ensure that growers receive a fair price.
- Develop central Coffee Marketing Depots (CMD) in more remote coffee growing areas.

The long term objective is to sustain production, quality, and ultimately growers income. The future of coffee industry rests with increased productivity, sustaining production and quality - not necessarily increased production.

To counter the highly volatile international prices, growers must be efficient to be competitive in the global markets.

4. PROSPECTS AND CONSTRAINTS

4.1 Prospects

- Generally, prospects of coffee industry continued to remain bright. This is clearly shown by trends in production over the years as discussed earlier. Potential for further development is in the smallholder sub-sector based on family units or individuals.

- As long as constraints impeding growth are removed and incentives provided, there is potential to increase production to double the present level to over 3 million bags. This also means income will double to over one billion kina - almost half the national Governments annual budget.

- Plantations and Blocks produces some of the best quality coffee in the world. Their profitability is reduced and costs increases as a result of a combination of factors including coffee theft, and law and order related problems. There is also lack of new investments in plantations.

4.2 Main Constraints

4.2.1 Budget Constraints. It was a general understanding between the National Government and Commodity Boards including then Coffee Industry Board (now CIC) when Corporatising, that level of funding will shift according to movements in international prices. When the prices are high, the industry Boards/Corporations will bare most of the operational funding component for research and extension. When prices fall, the government will bear most of the funding component.

Prices have fallen since last year, and continued into the first 7 months of year 2000. The international coffee market is currently saturated and it is expected that prices will remain low for some years to come unless bad whether hits major producing countries like Brazil.

The Corporation would require Government support for its research and extension services during this low coffee prices. Administration levy of 8 toea per kilogram is insufficient to fund the entire operation. To further add to funding shortfalls, production has declined this year as a result of bad weather. It is illogical to impose additional levy on the growers because they are already being hit by the current low prices.

The only option now available is for the Government to step in at this critical time. An estimated funding requirement from the government for the remainder of this year is K3 million, and K6 million per year from year 2001 onwards until prices improve.

4.2.2 The Coffee Industry Corporation fully endorses and supports all the recommendations made by the National Development Forum. Some of these include (but not limited to);

- Opposing the FAO proposal for Agriculture Reform, particularly relating to the Coffee Industry Corporation Act
- Poor infrastructure (roads, bridges, wharves)
- General Law & Order related problems and lack of community support
- Weak farmer/extension/research linkages as a result of very high extension/farmer ratio
- Inadequate marketing services for inaccessible areas
- High transport costs
- Inadequate private sector investment
- Volatile international prices
- Inadequate resources to support research and extension

- Limited access to credits

- VAT at the smallholder producer's level. Tax credit in terms of coffee pricing will have difficulty in implementation.

5. CONCLUSION

To conclude, I would like to re-emphasize the importance of coffee in the national economy and household income to growers. The industry was here before the oil and mineral boom, and will be here when they are gone. Any reforms to commodity boards should based on CIC as a model.

I would also like to commend the Government for their continuous support over the years, through various assistance programmes. These includes, price support, conversion of remaining price support loan to grant, and continuous funding for research and extension until 1999. I would also like to acknowledge, financial and technical assistance from international agencies including, AusAid and the European Union. The CIC will continue to look forward to assistance from the Government and International Agencies.

THE PNG COCONUT INDUSTRY IN THE NEW MILLENIUM

Robinson W. Namaliu[1], LLB, LLM.

1. INTRODUCTION

The coconut industry is the oldest agricultural industry in Papua New Guinea (PNG) and since the 1950s has played a pivotal role in fostering economic development in the lowland areas of the country. The coconut itself, is a major daily source of food and income for the coastal people and an important feed source for village livestock. On many atoll islands and remote areas of the mainland, coconut is the ony source of income for the rural population that exists there.

Economically, coconut is the third most important agricultural export commodity of the PNG lowlands. It provides an excellent choice of dual cropping with cocoa and other high value cash crops (e.g. spices, essential oils), and has provided grazing areas for cattle (beef) production.

The crop is grown along the coastal fringes of the mainland and on all islands extending from the Bismarck Archipelago to the South Solomon Sea. The total area under coconut cultivation is estimated to be about 260,000 hectares, 40 percent of which are large plantations, and the rest consist of samllholder plantings and village plots.

This paper highlights the present situation of the industry and the role coconut as a cash crop is playing in the agricultural economy, and outlines its future development needs, for the consideration of this Conference and the National Agricultural Council (NAC). It emphasizes the relative importance of the coconut as an export commodity, and the increasing role it has as a food source. It is the tree of life since time immemorial, and will remain an important source of economic wealth for the resource-poor people in PNG.

2. PRESENT STATUS OF THE INDUSTRY

2.1 Annual Production

Information on annual coconut production in PNG is limited to copra exports. Over the last 30 years, annual copra production has averaged 137,000 tonnes. Fluctuations in production are very much related to growers' response to the world price. An analysis of the price elasticity of copra supply in PNG has shown that when copra prices increase by 10 percent, this results in a 2 percent increase in production, and vice-versa (Yabro 1993).

Table 1 indicates that the total copra and coconut oil exports in 1998 were worth K 108 million, or equivalent to 10 percent of the total agricultural exports (QEB, 1999). in 1999, with the depreciating Kina, the total revenue from coconut products increased to K 128.5 million or constituting 12 percent of the total agricultural exports.

It is however estimated that an additional 60,000 tonnes of copra or 300 million nuts equivalent, are consumed domestically in daily diets (CCRI, 2000). The importance of coconut as a food source has also spread to the highlands of PNG, where it has become an integral part of daily food trade. To go by the prices of nuts at Port Moresby urban markets, which range from 20-50 toea per nut, the additional crop consumed locally as food would be worth between K 60-150 million annually.

2.2 Production constraints

The major constraints to coconut production in

[1] Chairman, Copra Marketing Board, Rabaul.

Table 1. **Copra and Cocout Oil Exports 1992 - 99**

YEAR	COPRA EXPORTS '000 tonnes	CNO EXPORTS 000' tonnes	COPRA PRICE K/ton/FOB	CNOPRICE K/ton/FOB	COPRA EXPORT VALUE Kmillion FOB	CNO EXPORT VALUE Kmillion FOB	TOTAL COCONUT EXPORTS Kmillion FOB
1992	47.5	34.8	247	625	11.8	24.1	36.0
1993	59.0	45.5	251	441	14.2	19.6	33.8
1994	50.3	34.7	292	579	14.7	20.1	34.8
1995	64.2	33.1	427	897	27.4	29.7	51.1
1996	99.2	49.6	494	1036	49.0	51.4	100.4
1997	90.3	48.6	523	1051	47.2	51.1	98.3
1998@	58.1	53.2	668	1010	38.8	69.7	108.5
1999@	81.3	42.0	765	1578	62.2	66.2	128.5

Source QEB, Central Bank of PNG (@ 1998 Agric. Exports = K1020 mill , #Estimated 1999 Agric. Exports = K1070 mill.

PNG are: the senility of existing palms, and the severity of beetle pest infestations that has prevented replanting with improved hybrid seed nuts. The beetle problem is quite serious in the Islands region, and has halted several redevelopment initiatives in East New Britain and New Ireland provinces.

The government has promoted the importance of producing quality copra by setting a price differential between "hot air" as the top grade copra and "smoke" as the lowest grade. A recent survey revealed that "smoke" copra is still a serious problem in at least four provinces, and must be addressed promptly.

One of the recent development in agriculture which has forced coconut areas, and hence production, to dwindle, is the establishment of oil palm in place of coconut plantations. This is most notable in Milne Bay and New Ireland provinces, on previously alienated land.

2.3 Corporate issues

2.3.1 Copra marketing

The Copra Marketing Board (CMB) is the statutory organisation solely responsible for the purchase and export of copra in PNG. It allows other private operators to export coconut oil and other coconut products and by-products under permit.

The Board has recently upgraded its management structure with the view to improve efficiency and accountability of its operations. The SCMCA and the Parliamentary SRC have already approved the new Board Management structure and the remuneration levels for senior managers.

CMB is required by law to maintain a marketing network of deports and sub-depots, and presently operates 9 main depots and 25 sub-depots and agencies throughout PNG. The Board has been criticised by some sectors of the industry for operating in this manner. Hence, recently, many have called for the deregulation of copra marketing in PNG. What cannot be guaranteed however, is whether private operators can sustain the current marketing network of CMB, and make a profit. Because, without this network, copra producers in many remote areas of PNG would be deprived of their constitutional right to their only source of income. This would be a direct consequence of a deregulated marketing system.

Because of the Board's concern on improving the farm gate price for farmers, it has commenced a freight study to ascertain the profitability of domestic shipping routes, and to establish a realistic basis for freight negotiations with ship owners. The analysis so far indicates that the copra freight rates currently being charged on

some routes are well beyond the allowed legal limits. The new tenders for copra shipping contracts will be based on the facts and information that has been assembled under this study.

One other issue that the Board will address is the review of the current copra price formula. A funding proposal to undertake this study has been submitted to the Government through the Stabex Committee.

2.3.2 Corporatisation

The CMB has now adopted a new 5-year Corporate Plan which sets out the vision and strategies for the future development of the coconut industry. Its fundamental objective is to increase production through the use of improved technological packages, and increased plantings and replantings throughout the PNG lowlands. The overall goal is to double the current annual copra production by 2010.

In line with the Government policy directive (NEC Dec. No. 15/99), the Board has also carried out an internal review of its corporate functions to determine what are the options for CMB and the Government to consider in a process of corporatising the industry. The final recommendations from this review would be presented to the Government's Committee on Privatisation of Public Bodies.

2.3.3 Research and Extension

CMB supports a comprehensive coconut research and extension programme in PNG through its shared-ownership with the Cocoa Board of PNG, of the Cocoa and Coconut Research Institute (CCRI) and the Cocoa and Coconut Extension Agency (CCEA). The two technical subsidiaries of the Board are funded through levies on copra and coconut oil exports, and presently CMB provides K 2 million anually to finance coconut research and extension work.

Based on the Board's new Corporate Plan, the strategic objectives for the sub-sector would be formulated intonew coconut research and development (R&D) agendas for CCRI and CCEA. The latest research results indicate that CCRI has made a break-through in the control of the most serious beetle pests of coconuts, and by the end of the year, recommendations of new coconut hybrids would be available to the industry. CMB has also embarked on a study to identify future coconut R & D thrusts and to set development priorities for promoting coconut as a viable industry in years ahead.

2.3.4 Downstream processing

In accordance with the Government policy on the promotion of on-shore downstream processing of primary produce, CMB approved the establishment of a coconut mill in Madang. The mill, which was established in 1996, is operated by a separate subsidiary of the Board, the PNG Coconut Commodities Ltd. The plant was a second-hand purchase from Tonga, which unfortunately rquired substantial refurbishment during its assembly in Madang. The annual crushing capacity of the mill has now been upgraded from 20,000 tonnes to 50,000 tonnes, which will vastly improve its viability as a business.

The first coconut oil mill in PNG is operated by the Carpenters Group in Rabaul. It has the capacity to crush 80,000 tonnes of copra annually. It is estimated that unless annual copra production increases significantly over 130,000 tonnes mark, copra exports could cease from 2001 onwards, as the two oil mills have the capacity to crush the current volume of cora produced in PNG. The Board does support such an eventuality, as it would generate more revenue for the country. However, how this is reflected in the copra price to primary producers is yet to be determined.

The Board has also established a small food processing facility at the CCRI Stewart Research Station in Madang to research and develop simple recipes for food items produced from the coconut. It is anticipated that a technical cooperation with an overseas University and the PNG University of Technology would be forged to undertake more detail work in this area.

3. THE WORLD DEMAND FOR COCONUT PRODUCTS

3.1 Coconut oil

The most important coconut product to world consumers is coconut oil (CNO). However, as another tropical vegetable oil, CNO competes very much with other oils such as palm oil, for its share in the global market. Traditionally, CNO has been used in the soaps and cosmetic industry because of its high lauric acid content.

More recently, lauric acid has been recognised for its unique properties in food use, which are related to its antiviral, antibacterial, and antiprotozoal properties (Enig. 1999). Now, capric acid, another of coconut's fatty acids has been added to the list of coconut's antimicrobial components. Also, recently published medical research has shown that natural coconut fat in the diet leads to a normalisation of body lipids, protects against alcohol damage to the liver, and improves the immune system's anti-inflammatory response (Enig, loc. cit.).

Clearly, there has been an increasing recognition of health-supporting functions of the fatty acids found in coconut. This can only be good news for copra producers, because it would put CNO in a more competitive position against other sources of lauric oils. Development of genetically modified plants as cheap sources of these oils, does pose a potential threat to tropical vegetable oils. However, the biosafety concerns over the use of such plants still remain debatable in the scientific world. The obvious competition to CNO comes from the palm kernel oil, but on a hectare basis, coconut growers would produce more lauric oils per hectare than palm oil growers would.

3.2 Other coconut products and by-products

The versatility of coconut tree is demonstrated in numerous other products and by-products that can be derived from this tree of life. In the Asia-Pacific region, many other products are being processed for domestic and export markets. These include desiccated coconut, coconut charcoal and coconut activated carbon, coconut coir and fibre dust, and coconut lumber.

The CMB has considered options to promote the commercialisation of many of these products, but requires financial resources to evaluate the suitability of related technologies and the economics of their production under the PNG situation. Given the depreciating Kina and the rising costs of imports, the opportunities of producing coconut products and by-products for domestic use must be explored in earnest.

4. THE FUTURE

4.1 The expansion of coconut plantings

The majority of coconut stands in PNG are over 50 years old, and with increasing hectarages of senile palms. Plantations have not had any replanting programme since the 1970s, and recent new plantings have occurred only in the smallholder sector. There is therefore a need to rehabilitate and replant existing coconut plantings throughout the country, as a first step to lift production levels.

This requires improved planting material and improved pest control measures. CCRI is presently planning for the establishment of four regional hybrid seednut production centres, which will supply material required for replanting. It is estimated that when the four seedgardens are established and in production by 2003, they will have the capacity to produce 800-900,000 seednuts a year. This would enable a replanting programme of 10-12,000 hectares annually.

The Board is proposing a coconut redevelopment project for the Government to consider funding in the 2001 Budget. The Board estimates that from the four seedgardens, a total of 50-60,000 hectares can be replanted over 5 years to high yielding hybrid coconuts. Potentially, this should result in an additional 75-90,000 tonnes of copra. If this programme is rigourously

supported, the Board's projection of doubling the current production by 2010 is highly achievable.

4.2 The promotion of downstream processing

The prospects of value adding for coconut products must be explored to the full as a matter of priority. The various items that can be produced have been researched elsewhere, and PNG industry should evaluate the potential of available techniques and technologies to suit local conditions and farmers' socio-economic circumstances.

The Government must support the Board's plans to enhance coconut oil processing on-shore. The domestic shipping freight would make this move inevitable, and Provincial Governments should be encouraged to promote joint-venture opportunities with interested investors for CNO production and export.

The ***CMB*** *Act* 1983, would need to be revised to allow the promotion and monitoring of business activities involving coconut products other than copra.

4.3 The participation of growers in industry development

The experiences over the last two years indicate that a greater formalisation of the growers' movement is in the good interest of the industry. To this end, the Government approved the establishment of a National Copra Producers Association (NCPA) in March 1999, and directed the Board to facilitate its establishment.

The Deputy Prime Minister and Minister for Agriculture and Livestock launched the NCPA on the 21th July 2000, after approval of its incorporation by the Registrar of Companies. The NCPA has established branches in East New Britain, Bougainville, New Ireland, West New Britain, North Solomons, Madang and Milne Bay Provnces.

It is anticipated that by December 2000, all provincial branches in the coastal and island provinces would be established.

4.4 The support of the Government

The industry is grateful of the Government's support through its Agricultural Price Support Schemes of the late 1980s and early 1990s for its sustainability. The industry currently owes the State K 5 million, and this arrears will be fully paid by December 2000. The Board had previously rquested that this loan is written off by the Government as it has done with the coffee and oil palm loans, but this was not supported by the key central agencies.

The Government has also supported the coconut research and development programmes of the Board since 1992. This support has largely been channeled through the Stabex programme of the European Union.

While this support has greatly enhanced research and development in coconuts, the requirement to rehabilitate and expand coconut areas remain as the most urgent need of the industry.

It is therefore proposed that the Government, commencing in 2001, provide a budgetary support to the coconut industry of K 5 million a year for five years to achieve the following:

- Develop improved technologies (hybrid seed nuts, pest control);
- Enhance extension to support district programmes;
- Rehabilitate and increase coconut plantings by 60,000 hectares;
- Promote the development of quality products and by-products of coconuts;
- Maintain an efficient marketing network for producers; and
- Overall, improve the rural livelihood of coconut growers.

5. RECOMMENDATIONS

It is recommended that the Conference and the NAC take note of the recent developments in the coconut industry, and support the CMB in its endeavour to improve the productivity of the sub-sector, and its contribution to the national economy. Specifically, the NAC should support the CMB in its endeavour to:

a) Improve its corporate functions, its efficiency and accountability;
b) Strengthen coconut research and development in PNG
c) Promote coconut downstream processing, and coconut product and by-product utilisation;
d) Promote participation of growers and producers in industry affairs; and
e) Seek and secure government budgetary support for a national coconut rehabilitation and redevelopment programme in 2001.

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PROSPECTS FOR RUBBER INDUSTRY

C.K. Rahman Galrich[1]

1. HISTORY OF RUBBER IN PNG

Rubber has been in the country for almost a century but kept a very low profile. The actual planting kick started after the 2nd World War with over 15,000 hectares mostly in Estates owned by large companies operating in PNG at that time namely, Steamships, Burns Philip and British New Guinea. The smallholder sector and resettlement schemes started taking shape in early 60's with new plantings in 8 lowland Provinces. All the latex from the trees was turned into RSS (ribbed smoked sheet) which at that time suited well for the simple farmer which needed very little capital input.

As years passed, the Estates owned by the large companies started diverting their business from agriculture to merchandise. Some of the Estates were abandoned or given to the land owners. Currently, the only rubber estate still in existence is British New Guinea Development which was taken over by s.a. SIPEF n.v Belguim in 1983 under the name of Galley Reach Holdings. The large run down plantations are tapped irregularly by the landowner groups.

The introduction of SMR (Standard Malaysian Rubber) brought a new life to the rubber industry in the year 1965. It was not until 1978, the technical rubber was first introduced in PNG at DOA FACTORY in Central Province and graded it as PNGCR (PNG CLASSIFIED RUBBER). The latex in the cup is allowed to coagulate itself and picked up on the second or third day after tapping. The cuplumps can be stored for many years with no quality problem. This system works very well as the farmer can keep the rubber and sell the rubber anytime when money is needed. In other words the rubber is like a cash which grows on trees. What is needed is to get up in the early hours of the morning and tap the 500 trees block and that is already like a cash in the bank for the farmer provided a ready market is in place. As mentioned above, Rubber is the most suited smallholder crop for the farmer in the remote parts of the country. Rubber collected from the tree can be stored for a longer period of time. No problem with disease or pest. No huge expenses to the farmer once the trees are in production.

There is a good demand for Rubberwood throughout the world. The trees are exploited after 20 years for their timber which is mostly used for good class furnitures. The first Rubberwood sawmill in the country was established at Doa Plantation in Central Province in 1997. Most of the sawn timbers are exported to Europe and Asia.

2. PRESENT LEVEL OF THE INDUSTRY

The current planting comprises of the following.

1. Estates	5000 ha	37.5%
2. Scheme/Village	8300 ha	62.2%
3. Research Stations	50 ha	0.3%
Total:	13350 ha	100%

The production from the above hectares can be easily turned around 12,000 tonnes per annum compared to the current 4,400 tonnes. There are various reasons for the low output.

3. CONSTRAINTS

1. All roads between points in the remote areas of the rubber growing areas are not accessi-

[1] Galley Reach Holdings (s.a. SIPEF n.v. Belguim Group). P.O. Box 2, Port Moresby.

ble by vehicles. There are virtually no links between point A and point B for bringing the crop for marketing,

2. With the Provincial reforms, the DPI officers are handicapped as there are no funds for them to operate and purchase the rubber from the farmers.

3. The farmers are not being regularly paid for their produce. Regular buying of at least once or twice a month will be more rewarding and boost the morale of the simple man in the Block.

4. At the moment Galley Reach Holding (GRH) has taken the task of helping the farmers with tapping tools and also various other forms of assistance on credit terms.

5. The management of Galley Reach Holdings has been visiting the farmers in the remote areas of the rubber growing provinces and buying the farmers' produce with no profit at all to the company. This is simply to keep the industry moving and to show that the little man that, there is still market for his rubber and also to encourage him to increase his production. Such an area which last visited is in Amazon Bay of the Central Province and also in the remote area of Ombisusu in Oro Province. We have made number of field trips to most parts of the rubber growing regions to see and hear the problems faced by the farmers.

6. The Industry is not receiving any support from the Government since 1997. This is due to reform, which is not benefitting the farmers directly. The DPI officers and DAL have been operating with limited resources with no vehicles to move around to inspect the blocks. Worst of all, no funds provided for produce purchase. In other words, the farmers who planted and waited for six long years to harvest and sell the produce on fortnightly or monthly basis have nothing to look forward for their hard work.

7. There are about 6,000 families directly involved in the industry, all in the rural areas in different parts of the country. With the dependants, we are looking at about 20,000 people whose basic daily needs depends on the proceeds from their rubber sales.

8. The current price of rubber in the World market is all time (30 year) low. The down turn in price is due to Indonesia dumping the market for hard currency. The Asian crisis has also contributed to downward trend. There are other contributing factors to the current low price.

9. The farmers are paid according to the World price. The prices are adjusted every month.

10. The transport and shipping the produce within the country is very expensive. There should be some sort of a subsidy from the Government to keep the cost down or otherwise the shipping companies should be more realistic in their charges for the agriculture produce. This has been brought up in previous meetings but nothing has been done to rectify the situation.

4. RECOMMENDATIONS

The rubber industry is one of the smallest agriculture export earner compared to other tree crops in the country. It's future and expansion program depends mostly with Government of the day. The future of the rubber in the World market is looking bright. The Industry is going through a rough period at the moment due to the price game between the producers and consumers. There will not be much rubber around when all the major companies in Indonesia & Thailand switch to Oil palm for a better return. It is already happening in some parts of Indonesia. Rubber is most likely to be a 100% smallholder crop in near the future. The World Bank in its forecast, has predicted a better future for Rubber. The Government should find ways to improve and expand the rubber industry for the benefit of the growing population. More rubber

settlements should be created in all parts of the lowlands.

There are currently 4 processing factories in the country with all of them running below capacity. Appended below the processing capacities of each factory per annum.

a) Galley Reach Holdings (Doa Factory) Central Province - 4,000 tonnes
b) Cape Rodney Agri. Project (Moreguina) Central Province - 3,000 tonnes
c) North Fly Rubber Co. (Kiunga) Western Province - 2,000 tonnes
d) Gavien Factory (Angoram) East Sepik Province - 1,000 tonnes

The first 3 factories are still on operation. Gavien factory is not in operation at the moment due to machinery problems. We need to upgrade the factory with more updated machinery. Need to inject about K2 million to upgrade with a more advanced and fast moving processing line.

5. CONCLUSIONS

Once again the Department of Agriculture and Livestock should be commended for its effort in assisting and keeping the Industry alive. Goods and services rendered by DPI staff to rubber farmers has come to complete halt in the rural areas. Visit to some of the rubber growing areas will prove that the situation is worse than anybody can expect.

In most areas, DPI has stopped their involvement in buying and selling the produce which was done before the reform. In previous years this worked very well with the farmers. The officers from the DPI visited the blocks and purchased the produce in more regular basis and shipped them across to the Factory for processing. Re-introduce the system by allocating funds for purchasing and getting DPI directly involve in providing the necessary needs of the farmer. The Private sector will also play their part in the marketing.

At the moment, the private sector namely Galley Reach Holdings and North Fly Rubber are involved in buying directly from the farmers in some areas but it will be *more effective if theDPI officers on site, take the task themselves.* The Government has to have close co-operation and co-ordination and work side by side with private sector to improve the Industry. If this can be achieved, the current level of production will be three fold in the next three years.

The current processing facilities in the country is well equipped for the increase in production. As mentioned earlier in the report, all the factories are operating below capacity and any increase in production means better throughput and low cost. This also will benefit the farmers with better returns and stop the influx of youths to the urban centers.

With this, I sincerely thank the Secretary, Mr. Miri Setae & the Acting Secretary, Mr Philip Pondikou and the Department staffs for providing the opportunity to the private sector to express and highlight the difficulties faced by the Rubber Industry.

Table 1. **Natural Rubber Export, 1986 - 99 (Quantity in tonnes)**

Year	DOA	Cape	Gavien	Mamba	Suma	Kiunga	Total Tonne	Value (K'000)
1985	3,272	880	-	480	272	115	5,019	3,668
1986	3,617	752	16	288	432	-	5,105	3,855
1987	3,429	208	272	161	182	-	4,252	3,397
1988	3,387	1,310	80	144	-	-	4,921	4,859
1989	3,079	1,190	320	316	-	-	4,905	3,359
1990	2,155	441	305	322	-	-	3,223	2,182
1991	1,834	478	460	-	-	-	2,772	1,835
1992	1,657	576	365	-	-	-	2,598	1,880
1993	2,650	237	461	-	-	-	3,438	2,494
1994	3,410	-	327	-	-	478	4,215	4,141
1995	3,557	418	422	-	-	999	5,396	8,946
1996	3,482	1,907	716	-	-	914	7,019	11,932
1997	3,015	1,248	136	-	-	187	4,586	6,709
1998	3,699	1,498	-	-	-	548	4,655	5,576
1999	2,622	1,324	-	-	-	479	4,425	5,651

Source: DAL Rubber Section.
Note: Value in FOB

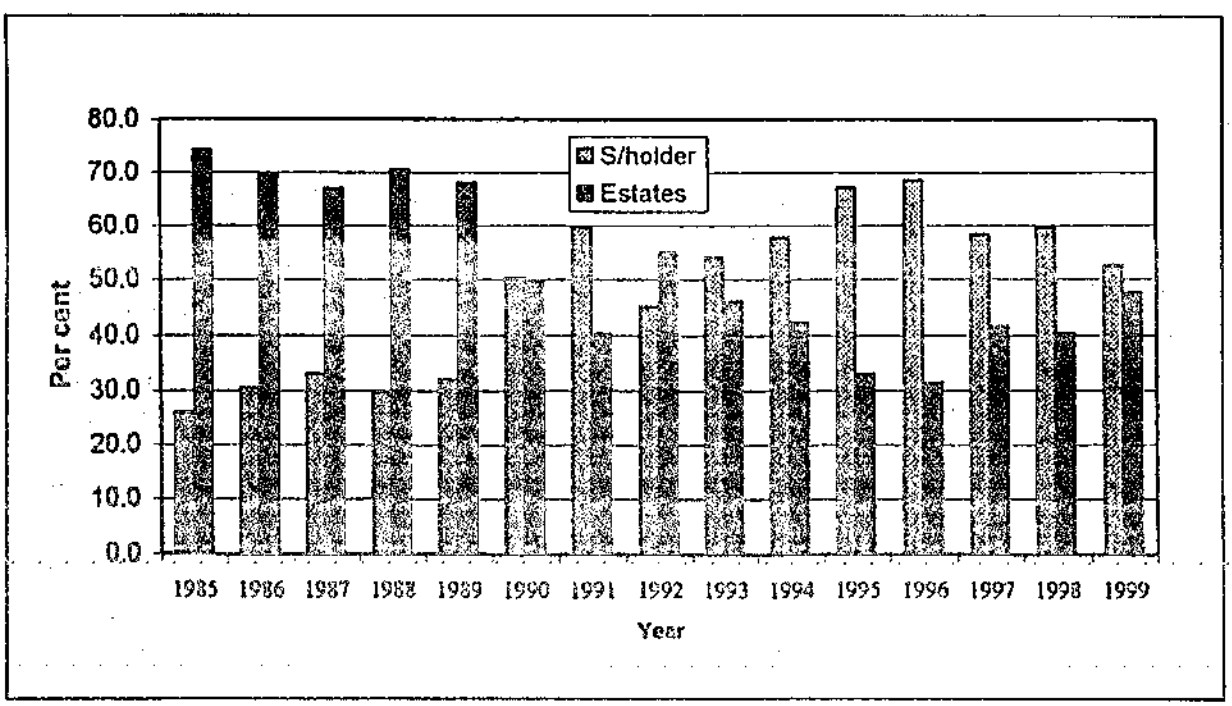

Figure 1. **Rubber Production by Sector, 1985 - 1999**

Table 2. **Rubber Production, 1985 - 99 (Quantity in tonnes)**

Year	S/holders	(%)	Estates	(%)	Total	Value Kina (FOB)
1985	1,296	25.8	3,723	74.2	5,019	3,668,000
1986	1,556	30.5	3,549	69.5	5,105	3,855,000
1987	1,401	32.9	2,851	67.1	4,252	3,396,500
1988	1,449	29.4	3,472	70.6	4,921	4,858,600
1989	1,610	31.9	3,442	68.1	5,052	3,359,000
1990	1,616	50.1	1,607	49.9	3,223	2,182,300
1991	1,659	59.8	1,113	40.2	2,772	1,835,300
1992	1,745	45.1	2,122	54.9	3.867	2,799,000
1993	2,615	53.9	2,233	46.1	4,848	3,514,800
1994	2,899	57.7	2,124	42.3	5,023	4,935,000
1995	4,368	67.1	2,142	32.9	6.510	10,793,500
1996	4,896	68.6	2,243	31.4	7,139	12,136,300
1997	2,676	58.4	1,910	41.6	4,586	6,709,000
1998	2,779	59.7	1,876	40.3	4,655	5,576,000
1999	2,322	52.5	2,103	47.5	4,425	5,651,000

Source: DAL Rubber Section

Table 3. **Smallholder Rubber Production, 1990 - 99 (Quantity in tonnes)**

Province	S/holders Growers	Planned Hectare	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Western	1,951	2,006	149	140	116	634	1,200	1,700	1,104	350	548	550
Gulf	104	218	112	40	20	100	75	120	127	12	27	4
Central	795	3,759	610	682	966	1,072	1,014	1,456	1,714	1,544	1,864	1,652
Oro	298	529	322	162	145	208	99	400	500	85	72	33
East Sepik	796	1,134	305	460	422	461	354	522	1,266	656	238	56
West Sepik	526	244	61	50	15	80	100	100	100	12	10	-
Manus	126	151	15	5	5	8	7	10	15	7	10	12
NewIreland	552	550	42	30	36	52	50	60	70	10	10	15
Total	**5,150**	**8,591**	**1,616**	**1,569**	**1,745**	**2,615**	**2,899**	**4,368**	**4,896**	**2,676**	**2,779**	**2,322**

Source: DAL Rubber Section.
Note: Value in FOB

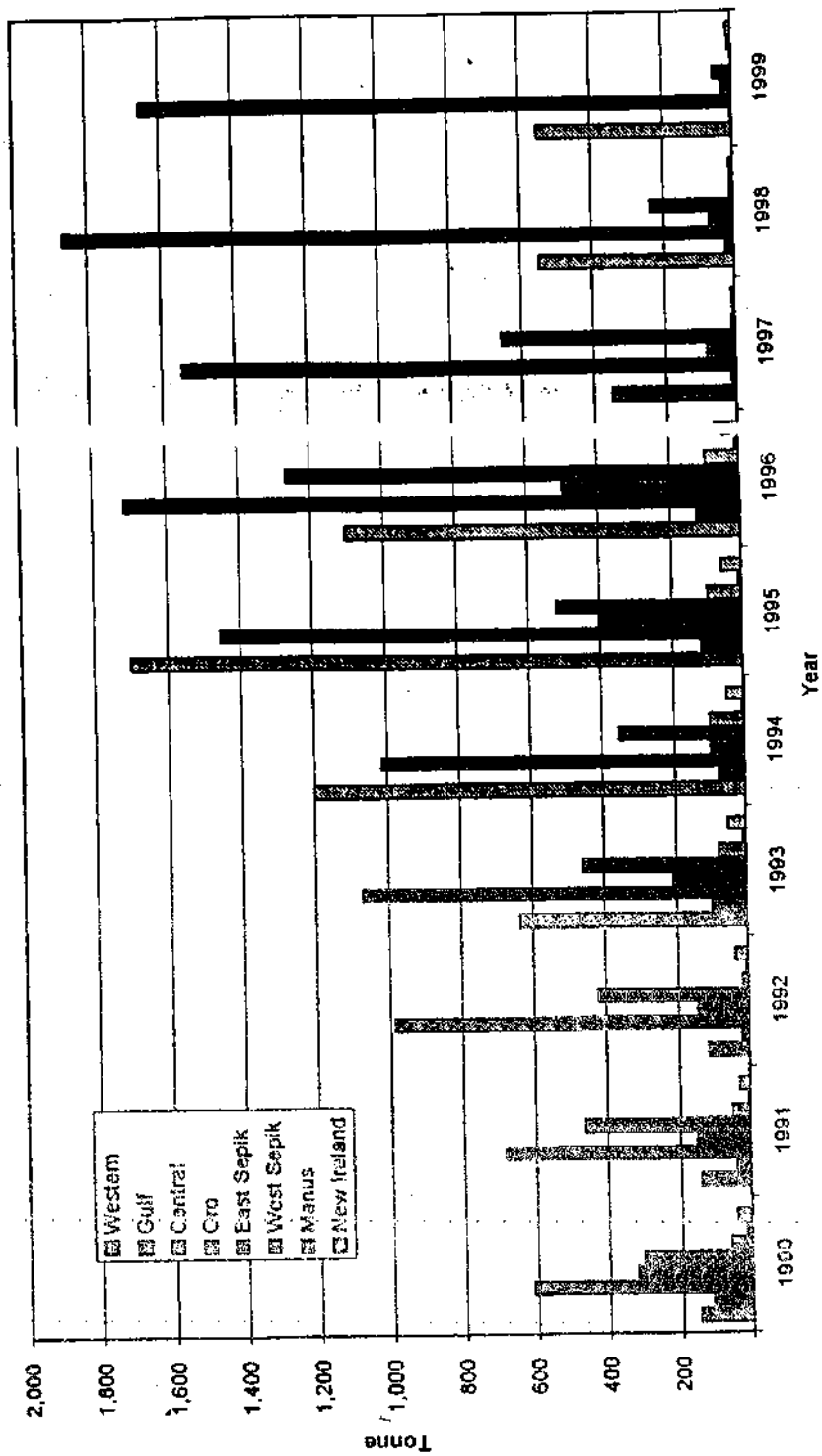

Figure 2. Smallholder Rubber Production by Province, 1990 - 1999

Table 4. **Rubber Statistics (Settlement Scheme, Village Planting and Estate Sector), 1999**

Settlement Scheme	**Settlers**	**Hectare**
Cape Rodney Agricultural Development Project	698	3,400
Bailebo (Central Province)	57	84
Murua (Gulf Province)	36	118
Gavien (East Sepik Province)	154	538
Sub-total	**948**	**538**
Village Planting	**Growers**	**Hectare**
Western Province	1,999	2,063
Central Province	378	359
Gulf Province	65	100
Oro Province	298	529
East Sepik Province	635	442
West Sepik Province	526	244
Manus Province	128	163
New Ireland Province	333	317
Sub-total	**4,362**	**4,217**
Estate Sector	**Workers**	**Hectare**
SPEF/BNGD - Belgium Co. Estate	600	5,112
Sogeri Rubber Dev. Corporation (SRDC)	40	1,126
EPO Estate	30	942
Other Small Estate	30	1,083
Sub-total	700	8,263
TOTAL	6,010	16,620
Bisianumu Rubber Station	20	50
GRAND TOTAL	6,030	16,670

PROSPECTS FOR COCOA INDUSTRY IN THE NEW MILLENNIUM

Sam Tulo[1], OBE.

INTRODUCTION

Allow me to congratulate the national Government and in particular the Deputy Prime Minister and Minister for Agriculture and Livestock - the Honourable Mao Zeming, MP for the foresight in convening this workshop. The objectives of this seminar in defining policies and strategies for the Agriculture sector to take us into the new millenium is timely as agriculture is the most important sector which supports more than 85 percent of the people of this country. The challenges facing agriculture are evolving and there is a need to constantly devise strategies to meet the challenges that lie ahead of us. Today as we enter the digital economy of e-commerce and the internet, the sector must constantly change to face the challenges ahead.

The cocoa industry plays an important role in the Papua New Guinea economy supporting a significant proportion of the population and as an important source of foreign exchange. The last census held in 1990 indicated that a total of 91,000 households depend on the industry for their livelihood by providing cash crop income or wages from employment associated with the industry. The industry is the third most important after coffee and oil palm in terms of its contribution to total agricultural export earnings. In 1998 alone cocoa contributed 9% or K73.3 million of total agricultural export earnings in comparison to that of coffee of 42% (K325.9 million) and oil palm 27% (K207.1 million). Over the past 12 years, the performance of the cocoa industry has come under increasing pressure from general decline in international cocoa prices, natural disasters and adverse weather conditions, plant diseases and the secessionist rebellion on the major cocoa growing province of Bougainville in 1989. From 1990 onwards, the industry was the recipient of a K96 million loan provided under the Government Agricultural Price Support Scheme (AGPS) that ended in 1995.

I am proud to say that the industry has continued to thrive dispite these odds.

CHALLENGES FOR THE INDUSTRY

Prices

The biggest challenge to the industry has been the downward trend in commodity prices which began in mid 1980s and continued up to the present time. Nominal FOB price fell by 55 percent between 1985 and 1990 from K2,013 per tonne to K908 per tonne. The decline in prices results in falling revenues and sends the signal to the grower whether to continue to invest in cocoa or shift to other crops where the returns are higher. Though cocoa prices peaked at K3,213 in 1998, this is lower in real terms due to increases in costs.

Natural and Man-made disasters

Cocoa production reached 32,000 tonnes in 1998/99 cocoa year after declining to 25,152 tonnes in 1996/97 - the lowest in over 27 years. Record production for the industry was attained in 1988/89 at 47,678 tonnes - an increase of 50% compared to the previous year. Following from the peak, production suffered over the next two consecutive years falling by 20% and 33% respectively in 1989/90 and 1990/91, due in part to disruption to production from Bougainville as a result of the crisis and the onset of plant ds-

[1] Chairman, Cocoa Board of Papua New Guinea, Rabaul

eases around that time. Production reached its lowest in 1996/97 at 25,1162 tonnes due to the combined effects of the extended drought and Cyclone Justin.

Constraints

The future viability of the industry is also impeded by lack of or poor transport due to poor infrastructure, which in turn leads to high freight costs and poor marketing facilities. The high capital costs and lack of cheap credit available to farmers have prevented further investment in the industry. The general law and order problem is also a hindrance and adds to cost as cocoa dealers take out insurance against potential threats.

In recent years the increase in costs as a result of the fall in value of the Kina have reduced the margins for the highly commercialised estate or plantation sector. This has resulted in the decline of the production from the plantation sector over the years.

PRESENT INDUSTRY AND GOVERNMENT INITIATIVES

The industry and Government have instituted various measures to support the industry over the years.

Agriculture Price Support Scheme

The Government price support scheme known as the Agriculture Price Support Scheme (AGPS) ended in 1995 with total assistance of K96,859,201 extended to the cocoa industry. The scheme was funded from a K15 million Government grant, K42 million from Stabex funds and the remainder extended as a Government loan to the industry. The industry through the Cocoa Industry Board is required to repay the Government loan through stabilisation levies collected on cocoa exports when the average monthly DIS price exceeds the trigger price currently set at **K2466.75**. Repayments of the loan have ceased since September 1999 as the average monthly DIS price has remained below the trigger price. The trigger is an estimate of cost of production for a typical cocoa producer. The balance of the Government loan still outstanding to the industry is **K29 million.**

Research and Extension

Coporatisation and privatisation of the research and extension function for the industry were implemented in 1995 to improve efficiency and the services provided to the growers. The PNG Cocoa and Coconut Research Institute (PNGCCRI) was established in 1995 and the PNG Cocoa and Coconut Extension Agency (PNGCCEA) established in 1997 to conduct research and carry out extension services in the industry. The industry has been funding its own research and extension through export levies of K20.00 and K5.00 per tonne respectively with some Government support that amounted to **K1.02** million to PNGCCRI and a lesser amount allocated to the extension agency. The funding for extension leave much to be desired as it covers only recurrent costs and is insufficient to enable the agency to mount a comprehensive extension program.

Research by PNGCCRI has been successful so far in developing hybrid and clonal varieties that has the potential to increase production. Current research is focussed on improving cocoa quality through the use of solar driers. Papua New Guinea is a leader on the use of solar technology for drying of cocoa where several proto-types of the solar drier have been introduced and adopted by a number of farmers. The adoption of this technology depends upon costs and level of cocoa prices.

The primary function of the PNGCCEA is to improve productivity through timely and effective provision of extension services as well as to improve and maintain quality of cocoa produced and exported to international market.

The Board introduced the Drought and Seed Subsidy Schemes in 1996 and 1997 to assist farmers affected by the drought and cyclone Justin. The Drought Relief Scheme provided

100% subsidy for new planting materials whilst the Seed Subsidy Scheme targeted farmers who expressed interest in expanding their areas under cocoa. These farmers are provided a subsidy of 50% on the cost of new planting materials. Both these schemes were implemented at an estimated cost of **K600,000**.

FUTURE POLICIES AND STRATEGIES

The design of future policies and strategies for the industry must take into consideration the realities of the industry and well-defined limits and factors. There is a need to separate the rhetoric from the realities by focussing on those strategies that could be implemented without incurring significant costs to the industry and Government. For the cocoa industry, the policies and strategies must aim to fulfil the Board's Vision Statement of assisting **"Papua New Guinea cocoa industry participants to have a sustainable livelihood by maximising real wealth in the growing, exporting and manufacturing of cocoa and cocoa products".**

Strategy 1: Production Target of 100,000 tonnes by 2015.

Guided by this vision statement and mindful of the need to support National Government development objectives, the Board has set a production target of 100,000 tonnes to be achieved over the next 15 years by the year 2015. Current initiatives by the industry - including the expected pick-up in production of 17,000 tonnes from Bougainville is likely to propel production to 57,000 tonnes over the next three years to 2003. We need to plan to achieve at least 2,870 tonnes or 6,825 hectares planted per annum over the next 15 years to achieve our target. In order to achieve this target require annual funding of K3.2 million or K470 per hectare. The Cocoa and Coconut industries are putting together submissions for funding of a 5 year rehabilitation and development program for the two industries which we hope the Government will consider favourably in the coming budget.

Village Cocoa Development Scheme

To achieve the production target the Board enunciated the Village Cocoa Development Scheme (VCDS) as a continuation of previous schemes to assist the farmers overcome the effects of the drought. This scheme has received funding of K200,000 in the Board's current budget. Under this scheme, growers who qualify for assistance receive subsidies on purchases of seedlings and farm equipment and tools. Funding has been exhausted due to the high demand for assistance.

Targeting Resource Project Areas.

The Village Cocoa Development Scheme is targeting new areas for planting cocoa where the mining and forestry infrastructure is already in place and in the case of timber projects the land which is highly suitable has already been cleared and is under-utilised. Some of these areas can be found in West New Britain, New Ireland and West Sepik. The only requrement is to assist the growers by providing them with cocoa seedlings and appropriate tools.

Cocoa Growers and Producers Savings and Loans Society

To support the production drive, the Cocoa Board has decided to part with the rhetoric of diagnosing the problems of the sector by pioneering the establishment of the Cocoa Growers and Producers Savings and Loans Society in June 1999. The establishment of the Growers Savings and Loans is intended to pool the savings of the growers and make it available as cheap loans for further investment in the industry. So far more than 1000 members have signed up and members savings have surpassed the K200,000 mark. We remain hopeful the scheme will address a major constraint in the sector.

Focus on Smallholder Sector

Future policies and strategies will need to target the smallholder sector that has replaced the estate or plantation sector as the dominant pro-

ducer of cocoa in Papua New Guinea accounting for 80 percent of production compared to less than 20 percent in the seventies. The low cost nature of smallholder production which uses minimal inputs such as chemicals and fertilisers explain the resilience of the sector in absorbing the increases in cost of production. Production costs have soared as a result of the depreciation in the value of the Kina.

Revitalisation of the Plantation Sector

Production by the plantation sector sustained heavy losses due to increases in costs of production, poor management and the series of disasters including the Bougainville crisis. In Bougainville alone a total of 56 plantations remain run-down due to the crisis resulting in a significant loss in production of almost 20,000 tonnes. There is a similar story in East New Britain where a number of plantations are now run-down due to poor management. Plantation quality cocoa carries a premium on the world market and it is important that any program for increased production should focus on revival of this sector.

Strategy 2: Increasing Industry Competitiveness

A strategy of maintaining and increasing competitiveness in the industry is important to maintain producer incomes and grower loyalty to an industry facing competition from other export crops and enterprises.

Price Stabilisation

The usual intervention of supporting producer prices has its limitations and has been rejected by both the IMF and World Bank as strategies to beef up crop production. This is for the simple reason that the criteria for continued investment in any enterprise is the return or difference between price received and cost per unit of output. The returns for cocoa output would only increase if price increase or due to a reduction in costs of production. This is the universal law governing investment.

Price support and stabilisation has limited value and cannot be sustained as evident in the Agricultural Price Support Scheme introduced in 1989 and terminated in 1995. The industry has an outstanding loan of K29 million to repay the National Government.

Market Information

The free flow and availability of market information an important characteristic of a perfectly functioning market and in promoting a competitive industry. Cocoa prices are determined on a daily basis at the London and New York terminals. The availability of the internet service in Papua New Guinea will be explored to improve the flow of information regarding the market to the growers and other stake-holders in the industry.

Plans are underway to provide weekly information on the cocoa market and prices utilising the radio services in all cocoa growing provinces.

Price Risk Management

The Board is exploring the possibility of introducing commodity price risk insurance in PNG right to the producer level as a means of managing the fluctuations in cocoa prices and lessening the risk and uncertainty faced by small growers. The Board has sought Stabex funding for a study of the use of price-risk management instruments by cocoa farmers and traders in PNG.

Strategy 3: Quality Improvement

Improvement to the quality of cocoa increases the demand and hence return to the grower. A concerted program is required to run courses for growers on better techniques for harvesting and processing of cocoa. Some years ago quality inspection before export was decentralized to exporters. Unfortunately, there had been laxity resulting in some low quality cocoa being exported. Adequate manpower is required to conduct these programs and to carry on the spot checks on fermentaries to detect weaknesses in quality control. The Board currently has four

operational regional offices manned by Senior Inspection officers whose primary function is to monitor compliance by growers and buyers of cocoa to quality standards set by the Board. There are plans by the Board to increase the number of regional offices to cover most of the main cocoa-growing provinces. Implementation of this plan will depend on availability of funds.

Papua New Guinea is a pioneer in promoting the use of solar-powered dryers with the aim of alleviating the quality problems associated with smoke, taint and poor processing. A number of farmers have adopted the proto-type after the successful field-testing carried out by the PNG Cocoa and Coconut Research Institute. The Cocoa Board is moving to legalize the use of solar dryers in approved areas. Solar dried cocoa will certainly fetch premium prices on the world market.

Strategy 4: Organic Cocoa

An outstanding feature of our cocoa is the fact that it is grown on village plots utilising minimal or no inputs such as chemicals and fertilisers. Papua New Guinea can target the growing niche market for environmentally friendly and organic cocoa with ease. Setting higher standards for organic cocoa and the introduction of accepted organic certification will enhance entry into the organic market.

Strategy 5: Downstream Processing

Downstream processing continues to be a major policy of the National Government and the Board is vigorously pursuing strategies to achieve this objective. The advantage of downstream processing is that it increases value of the product and the returns to the grower.

In addition, downstream processing makes it possible for PNG cocoa to penetrate markets that do not import PNG cocoa directly due to lack of semi-processing facilities. This includes Japan, Australia and New Zealand. A small amount of our cocoa is exported in cocoa butter form that has a higher value than cocoa beans. The Board is continuing to encourage the private secor to invest more in adding value to their exports.

The Board engaged the services of Wiley and Coconut Product Limited of Wetern Samoa to undertake a pre-feasibility study on the establishment of a chocolate factory in the country. A number of cocoa companies have expressed interest in participating in such a venture if it does eventuate. Such a project increases the demand for our cocoa and the price growers get for their produce.

CONCLUSION

I conclude by saying this: as far as cocoa is concerned, suitable land is still available in many provinces. At the same time, there is enormous interest in cocoa farming and a lot of people are ready and willing to go into cocoa farming. In the East New Britain and Bougainville Provnces where land availability is becoming a problem, people still express strong interest to go into cocoa farming. There is a need to look at the acquisition of abandoned plantations and have them sub-divided into smallholder plots.

Unfortunately, on the othe hand there are certain constraints that must be overcome with the assistance from the National and Provincial Governments, donors and local members of Parliament. These constraints include lack of poor infrastructure, lack of marketing services in some areas and limited marketing services in most areas, lack of credit facilities, poor extension services and high freight costs.

It is our conviction that cocoa is a comparatively and competitively viable tree crop, thus cocoa is here to stay. The challenge is not to rest on our laurels but strive to improve the viability of the cocoa industry further. I hope you agree that with the appropriate financial support from the National Government and Provincial Governments and donors we can achieve a lot for the cocoa industry.

The Board is counting on Government and donor

support to implement these strategies for the benefit of the cocoa growers who live in villages throughout the country. We hope that the development of appropriate strategies that will result from this seminar will be matched by increased resources from the National Government to assist the industries realise their full potential and contribute to achieve the economic and social objectives of the National Government.

PROSPECTS FOR SPICE INDUSTRY IN PAPUA NEW GUINEA

Michael Waisime[1]

1. INTRODUCTION

Since the 1980s the Government had stressed the view point of *Crop Diversification* from traditional crops like coffee, cocoa, copra, etc. In this respect the Government, through the Department of Agriculture and Livestock, based on a Medium Term Development Programme (MTDP, 1987 - 1991) initiated a Public Investment Programme that was known as the Alternative Crop Expansion and Diversification Programme (ACEDP). The Programme was known to have been successful given the various constraints until its abolition and transfer to the provinces in 1995.

With growing interest on alternative crops including spice crops such as cardamom, chillie, pepper, turmeric. ginger, cinnamon, etc., the National parliament enacted the *Spice Industry Act, 1989* following which the PNG Spice Industry Board was established in 1991. Since then, the Board has never really functioned effectively like other commodity boards due to funding constraints and had yet to be fully established and operational.

It is hoped that this brief would throw some light on the plight of the PNG Spice Industry Board in its endeavour to rejuvenate, promote and develop the spice and alternative crop sub-sector and seek financial assistance, from the National Government to support the industry and the farmers in a sub-sector that has enormous economic and social potential.

2. BACKGROUND

2.1 Following the need to corporatise government responsibilities in the commodity sector the National Parliament passed the *Spice Industry Act, 1989*. The Papua New Guinea Spice Industry Board (Board) was then established under this *Act* in 1991, similar to the other commodity boards such as the Coffee Industry Corporation, Oil Palm Industry Corporation, and the Copra Marketing Board with the task to regulate, promote and develop the spice industry and alternative crop sub-sector. However, unlike the other commodity boards the Spice Industry Board is responsible to develop more than one crop. These include:-

cardamom (*genera Ellettaria, Amomum and Afromum);*
chillie, paprika, pimento, tabasco (*Genus capsicum*);
pepper (*Piper nigrum*);
ginger (*Zingiber officinale*);
cloves (*Syzygium aromaticum syn Eugenia carophyllus*);
nutmeg and mace (*Myristica fragrane*);
annatto (*Bixa orellana*);
turmeric (*Curcuma longa*);
vanilla (*Zanilla fragrane*);
cinnamom (*Genus Cinnamomum*) and;
mint (*Genus Mentha*);
herbs and essential oils.

2.2 Due to the lack of funds and direct budgetary support from the National Government, the PNG Spice Industry Board, since its establishment, has not been able to carry out in full all its functions as stipulated in the *Act*. The only source of funding support has been through grants from the Department of Agri-

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culture and Livestock (DAL). Budget estimates prepared by the Board's Office and submitted to the Government in the last three (3) years for budgetary support has not been granted by Government during the 1998, 1999 and 2000 financial years. This has left the Board crippled and ineffective in carrying out its responsibilities and functions in the agricultural sector and the spice industry.

Programs to develop the spice industry, particularly on extension services, research and training have been funded and carried out by DAL through the Alternative Crop Extension and Diversification Programme (ACEDP). The ACEDP is a Public Investment Programme implemented in 1988 aimed at diversifying export crop base. The Programme funding ceased in 1995 leaving some 28,000 farmers unattended to and a loss of interest and decline in spice production and export.

2.3 The Board has only two (2) administrative staff and has been relying entirely on the DAL/ Provincial Division of Primary Industry through the Alternative Crop Expansion and Diversification Programme (ACEDP) for technical manpower and facilitation of field operations. This does not allow the Board to exercise its powers and functions to support a potential industry and its farmers due to the principal reason of 'lack of funds' or no budgetary support.

3. POLICY DIRECTIVES AND OBJECTIVE FRAMEWORK

3.1 Policy Directives

The policy framework in which the spice industry is to be promoted and developed by the Spice Industry Board is spelt out in the **WHITE PAPER ON AGRICULTURE** reflecting current Government commodity policy initiatives on spices, herbs and essential oil crops. Policy directives by the Government includes:

- to encourage the development of appropriate alternative cash crops farming research into their husbandry, varieties and yield potential resistant to pests and diseases which would lead to increase in production per unit of input;

- to develop appropriate alternative cash crops farming and extension systems through effective information network among the research institutions, farming communities and the industry as a whole;

- to develop alternative cash crops farming systems relevant for farm households by integrating cash crops and food crops as additional source of income without compromising crop yields;

- to continue to facilitate development of alternative cash crops towards downstream processing for value adding or exports and domestic consumption, quality improvement schemes to sustain Papua New Guinea's status as quality crops producer; and

- to encourage the development and provision of marketing, marketing research and information for the industry and potential users.

3.2 Objectives

With numerous spice crops been entasked to the PNG Spice Industry Board, the Board's development objectives in line with its functions and responsibilities are to;

- encourage the production of various spice crops as an alternate cash crop and source of income for farm households;

- promote the production, consumption and export of spice crops in the country,

- monitor the development of the Spice Industry to facilitate growth and industrial development;

- promote spice industry as an alternate

means of rural household income, and employment opportunities;

- ensure that the spice industry has a broader production and market base;

- facilitate the development of the sector's export base to increase foreign exchange earnings.

- in collaboration with the Department of Agriculture and Livestock, Provincial Primary Industry Offices and other concerned national and international institutions develop appropriate crop farming extension system and promote applied research to improve efficiency and productivity in crop yield and pest/disease resistance;

- develop and support an effective marketing system for the industry in the domestic and international markets for spice crops to ensure that the sector is viable and that the net income to farmers is maximized.

4. THE SPICE INDUSTRY - STATUS AND PROSPECTS

4.1 Field Achievement to Date

The growth of the industry to date has been relatively encouraging. Programs undertaken by DAL through ACEDP between 1989 and 1995 covering nursery, extension and production, training, research and marketing has resulted in some 28,000 farmers, covering 682 villages across the country, been involved in spice crop farming. Latest estimates as at 1995 show some:

- 930 ha of Cardamom planted
- 283 ha of Chillies planted
- 10 ha of Vanilla planted
- 266 ha of Pyrethrum planted
- 20 ha of Nutmeg planted
- 86 ha of Pepper planted

* ACEDP programme. Figures do not incorporate private & Provincial Government initiatives

With necessary climatic condition, information, government budgetary support for programmes, promotion, extension services and marketing support there can be a significant increase in farmers interests in cultivating these crops.

The production and export of spices and essential oils according to the ACEDP for 1992 and 1993 are:

1992	Production (tonne)	Export (tonne)
Cardamon	95.14	73.24
Chillie	15.43	22.25
Vanilla	NA	87.00 (kg)
Pyrethrum	31.51	NA

1993	Production (tonne)	Export (tonne)
Cardamon	96.63	75.82
Chillie	31.86	27.28
Vanilla	935.09 kg	856.31 (kg)
Pyrethrum	272.00	NA

Factory (Kagamuga Natural Product P.L) has since been closed.

PNG has demonstrated that it has great potential for production and export of spices, particularly cardamom and chillie. In 1986 some 387 tonnes of cardamom was exported representing 3.2% of the total world production (12,000 tonnes). For chillie in the same year, PNG exported 75 tonnes which is about 1% of both total world production and exports. Despite the remoteness, difficulties and funding constraints encountered, these results are positive.

4.2 Crop Production, Export and Potential

Presently there is limited information on the country's total supply position for the various

spice crops, though there is a general awareness that a number of provinces such as, Central, Gulf, Oro, Eastern Highlands, Simbu, Morobe, East and West Sepik, East and West New Britain and Manus have spice programmes and projects. In any case estimates of production of spices in 1996 are as follows:

Estimates of Production of Spices in 1996 (Tonnes)

Province	Cardamom (dry)	Birds eye Chillie (dry)	Ginger (fresh	Turmeric (fresh & dry	Vanilla (processed)
Central Province	1.0	0.5	-	2.0	-
Milne Bay	3.0	0.5	-	-	-
West New Britain	1.0	4.0	2.0	2.0	-
East New Britain	1.5	4.0	2.5	2.5	1.0
Oro	0.5	3.0	1.5	1.5	-
Morobe	-	3.0	1.0	2.0	-
Madang	0.5	2.0	1.0	3.0	-
Eastern Highlands	10.0	30.0	50.0	50.0	-
Simbu	50.0	10.0	30.0	50.0	-
East Sepik	0.5	1.5	-	20.0	Neg.
West Sepik	-	0.5	-	-	-
Total	68.0	59.0	88.0	133.0	1.0

4.3 Country Potential

The Country (PNG) is rich with a lot of business opportunities, in agriculture. PNG has a sub-tropical and tropical climate with fertile land for all forms of spice crops. Following a study requested by the Department of Trade and Industry and commisssioned by the Commonwealth Secretariat in 1996 on the 'Export Potential for Spices in PNG', the 1996 indicative figures on area and production are relatively low compared to the country's capabilities. The study revealed that PNG has the potential to develop a viable spice export industry to the tune of US Dollar 60.0 million (K 180 million) annually).

4.4 Organic Spices

The bulk of production of spice crops are naturally grown and maintained with no chemicals or fertilizers and as such the country is ideally placed to offer organic spices internationally. Organic spice, and other tree and food crops are currently very much in demand all over the world, particularly Europe, the United States and Canada with increasing popularity in Australia and New Zealand.

The advantage of producing organic spices is the reduced negative effects on the environment and reduced cost of chemicals to the farmer and the industry.

4.5 Employment

With the current and increasing level of unemployment support by the agriculture sector in providing meaningful employment and active, productive participation in the informal

sector is important. The spice industry is mainly supported by smallholder farmers. Youths and women participation is an important aspect in the industry, which is smallholder and family units based.

4.6 Export Marketing

PNG spice crops such as Cardamom, Chillie, Vanilla and Nutmeg have very good export market. The recent floating and devaluation of the Kina has made PNG spice crops competitive internationally. Added with the fact that spices are high value crops (price per unit bases), the spice industry has become favourably, an high-income cash crop.

Markets for PNG spices have been identified in Europe, the MIddle East, Asia, and the United States. For instance, there is keen interest and orders from the United States for vanilla. Sri Lanka for chillie (5,000 tonnes/year), Singapore for chillie (50 tonnes/year), Japan for ginger, England for vanilla, chillie, cardamom (100 tonnes per crop/year), etc. The PNG Spice Industry Board is now placed with the difficult task of assisting the farmers and the industry and their crops in attaining these markets and revamping the industry to be more commercially viable.

One of the major problems that the Board will have to address is that of marketing. There are no effective marketing network established as yet. Many of the local companies that are involved in purchasing produce from farmers and exporting are inconsistent in servicing the farmers need to dispose of their harvest. These firms do not have the capital to stay in the business long enough and their purchase and export activities are not consistent so that the farmers have a steady income, in the long term causing a decline in interest in maintenance of spice crop farming. The Board will have to address this problem to ensure production, standards/quality control and marketing is maintained and competitive internationally.

4.7 Registered Spice and Herbs Exporters

One of the functions and powers of the Board is to register and maintain a registry of buyers, processors and exporters of spices in the country. To this effect the Boards has to date screened applications and has registered nine (9) exporters as per *PART VII* of the *Spice Industry Act. 1989*. These registered exporters have been issued Certificates of Registration and include:

1. Mr. John Kuttson, P.O. Box 66, BANZ ,Western Highlands Province.
2. Village Spices, P.O. Box 5573, BOROKO, National Capital District.
3. Folleywell No. 6, Pty Ltd, P.O. Box 1593, RABAUL, East New Britain Province.
4. Niugini Spices & Trading Co. Pty Ltd, P.O. Box 2431, LAE, Morobe Province.
5. Railoma Trading, P.O. Box 3908, LAE, Morobe Province.
6. Bangui Boi-Products Pty Ltd, P.O. Box 1234, MADANG, Madang Province.
7. Pauru Metropolis Investments Ltd, P.O. Box 225, BOROKO, National Capital District.
8. Dua Estate Ltd, P.O. Box 323, MAPRIK, East Sepik Province.
9. Dabola Cocoa Exports Ltd, P.O. Box 53, WEWAK, East Sepik Province.

The registration of applicants requires that the Board screens applications based on approved guidelines. Conditions for application consideration, registration, certification, cancellations and appeals are provided for under the *Act*. **however funding constrains has prevented the Board to fully exercise its responsibilities in this respect.**

48. Extension Service Support

With the passage of the Organic Law on Provincial and Local Level Governments these provinces and the local governments are given more responsibilities and resources. In line with this, reforms the extension services have become the responsibility of the provincial/

local governments. Development programmes and in particular, the Alternative Crop Expansion and Diversification Programme (ACEDP) administered by DAL has since 1996 been transferred to the Provinces. This transfer of the ACEDP to provinces, however, lack the necessary funds transfer and as such provinces where ACEDP projects were carried out (e.g., Central, East New Britain, Enga, Milne Bay, Oro, Eastern Highlands, Southern Highlands and Western Province) have suffered badly; leaving provincial spice support activities and spice farmers unattended.

Whilst the extension services in each province are the responsibility of the Provincial Government planning and coordination, training, research and marketing will be the Boards activities. It has been observed that after decentralization and the structural adjustment programme, field staff have been constraint by lack of proper directions, absence of incentives and motivation, management and funding constraints which impede adequate execution of field work. The Board sees that the revitalization of the extension service is a necessity with the assistance of the Alternative Crop Expansion and Diversification Programme (ACEDP) of the Department of Agriculture and Livestock.

4.9 Constraints

Funding levels for spice development programmes and projects both at the National (Spice Industry Board and National DAL) and Provincial/District Level have never beensufficient or nil in most cases. Funding support from government is most essential to develop all development aspects of the industry including; development projects, provincial extension support services, crop research, strengthening of the PNG Spice Industry Board, training, improvement of marketing arrangements, facilitating quality testing laboratory, encouraging down stream processing, and developing export oriented programmes. To develop an economically viable industry all phases of the industry development programmes needs to be supported with funds and technical manpower by government or donor agencies.

Research and training is at a low level and in need of sufficient scientific trained man power and laboratory facilities. Though wide variations in yield and quality are noticed for spices in the field, high yielding varieties with superior quality are yet to be selected. Most of the cultivation and processing methods followed by farmers are conventional too. Extension personnel are not only inadequate but also to a certain extent ignorant of improved technologies. As a result quality of spices is greatly lost, for instance:

i) Good quality green cardamom capsules are allowed to over-ripe on plants and partially to the ground. A fair percentage of harvest capsules are split open without the desired green colour. Capsules are dried using inefficient hot air chambers built with metal sheets. There is no temperature controlling system and firewood is used excessively. The dry product obtained as a result is only good for disposing as cardamom seeds.

ii) Processing of Vanilla beans in many areas is caried out traditionally. That is, the green beans without sorting are directly dried in the sun not adopting "Bourbon Method" for producing quality beans. The boiling method which is recommended for making better quality products is not familiar to many processors and growers.

iii) Turmeric processing is carried out unhygienically by cutting the rhizomes and fingers without washing and then drying on unclean surface.

iv) The quality of dried birds-eye chillie varies from farmer to farmer.

To strengthen spice production it will be necessary to develop information manuals (on

crop husbandry techniques, post-harvest preparation, etc.), nurseries projects and demonstration plots, training/workshops, purchase and export of produce for smallholder farmers. This will be done through the implementation of effective management of the industry by the Board, extension services, research and marketing programmes in order for the industry to be reactivated and promoted.

5. SCOPE AND FUNCTIONS OF PNG SPICE INDUSTRY BOARD

5.1 Scope of PNGSIB's Operations

The Board endeavours to promote and develop the spice industry and alternative crop sub-sector as a means of income generation, create employment opportunities, increase foreign exchange earning for the country and encourage meaningful participation for the rural people.

The major constraint imposed on the Board is the lack of initial budgetary support by the government for the Board to carry out its functions and execute development programmes in the country to develop the spice and alternative crop sub-sector.

Some of the major infrastructure developments that are already in existence throughout most commodity growing regions in the country would serve to link farmers who intend to participate in spice production and selling. With government budgetary support, the PNG Spice Industry Board's scope of operation would be to:

- initiate programmes and activities to promote and develop the spice and alternative crop sub-sector.

- resurrect the Alternative Crop Expansion and Diversification Programme (ACEDP) as the Board's 'Extension Arm' which would continue to liase and jointly carryout programmes primarily aimed at promoting spice and crop diversification in the country to include cardamom, chillie, pepper, ginger, turmeric, vanilla and essential oils. Other crops to be encouraged are mint, mace, cloves and cinnamom;
- In view of the locality, soil and climatic conditions to select those crops with optimum production and market potential, and to increase small farmers' income by rehabilitation and or expansion.

- In collaboration with the Provincial Government (Division of Primary Industry) determine and carry out planning, training and research on spice and alternative crops in the respective provinces;

- Establish pilot project such as nurseries and demonstration blocks in selected areas in each region for seedlings/cuttings distribution and training/demonstration for farmers;

- Re-activate farmers' commitment to spice and alternative crop production by establishing regional marketing outlet and engaging in produce buying from farmers which would be sorted, graded, packed, labelled and exported.

5.2 Functions

The functions of the Board as prescribed by the *Spice Industry Act. 1989* are aimed at promoting and developing a viable industry in the country. These are:

a) to control and regulate the processing, marketing and export of spices;

b) to promote the consumption and export of spices;

c) to promote research and development programmes for the benefit of the spice industry;

d) to compile statistical data on production, imports and exports of spices and to be familiar with production trends throughout the country and provinces and interna-

tionally;

e) to register buyers, processors and exporters of all or any of the spices;
f) to keep a register of buyers, processors and exporters of spices;

g) to formulate a register of processors and of spice grading systems for each of the spices;

h) when required by the Minister, to act as an agent for, and to carry out the obligations of the State in international forums or agreements;

i) to make known to the spice industry the activities of the Board; and

j) to do all things which it is required by the *Act* to do or which are necessary or convenient to be done by the Board for giving effect to the *Act*.

It is envisaged that the programs that are developed and executed by the PNG Spice Industry Board will enable technology, information and knowledge to be developed and commercially utilized so as to assist a viable, competitive industry with the goal to further its development aspirations in this new millennium.

6. PRESENT STATUS OF THE BOARD (SIB)

6.1 Board Structure

The Spice Industry Board was officially launched in 1991. There ae seven (7) members to the Board, being:

1. the Head of the Department responsible for Agriculture matters, ex-officio, or his nominee;

2. four persons who are representatives of smallholder spice growers; and

3. two persons who are representatives of larger commercial spice growers or exporters.

The farmers and industry representative for the Board are appointed by the Minister to represent the interest of the group and one of which is appointed Chairman and I am the current Chairman.

The Board members are appointed for a period of three years, with the present members' term commencing in August, 1998 and will expire in August, 2001.

6.2 Board Office and Administration

The Board has a small administrative office run by an Executive Officer appointed by the Board to administer the functions and affairs of the Board; while it relies solely on the Department of Agriculture and Livestock/Provincial Division of Primary Industry through the Alternative Crop Expansion and Diversification Programme (ACEDP) for technical support and facilitation of field and extension services. In this respect the PNG Spice Industry Board does not have an extension arm or Agency, as in the case of the Cocoa/Copra Extension Agency, CoffeeExtension Agency, etc.

With the non-funding of the ACEDP from 1995 andunder the current structural adjustment programme facilitation of field and extension services would now have to be sought from Provincial Division of Primary Industry. In any case most Provincial Divisions of Primary Industry are constrained with insufficient funds and as such do not have the capacity to operate effectively. It is recommended that the ACEDP be resurrected as a Public Investment Programme to support the Board. (*See attachment 2 on Proposed Board Corporate Structure*).

Currently the Board's Administration and Office facilities are located at the DAL Head Quarter, Konedobu, National Capital District

and include;

Staff (2) : 1 Executive Officer
1 Administrative Clerk
(Support Staff)

Facilities : Vehicle 1 (2x2 Hyundai Sonata Sedan)
: Office Space (provided by DAL)
: Utilities (Telephone/ Facsimile/Electricity, etc. provided by DAL.)
: Office Equipment's 1 PC (Olympia)

6.3 Board Meetings

Since the passage of the *Spice Industry Act. 1989* followed by the establishment of the Spice Industry Board in 1991, Board Members were appointed by the then Minister. As a legally instituted body, Board meetings were convened. Following the passing of the first Board Chairman, Mr. Harding, Board meetings failed to be held on a regular basis. Coupled with the lack of budgetary support to enable the Board to be more independent, the *Spice Industry Act. 1989* has not been fully administered.

In order to re-activate the Board, new Members were appointed in August, 1998 for a three (3) year term. Due to funding constraints only two (2) meeting have been convened in March and November, 1999. Meeting will be held this year (2000) to deliberate on issues of the industry when funds permit.

6.4 Board Programmes and Activities

To-date the present Board has been handicapped to fully institute programmes to promote and develop the industry. Programmes and activities implemented to support the spice and alternative crop sub-sector have been carried out under the Medium Term Investment Programme (MTIP) called the Alternative Crop Expansion and Development Programme (ACEDP). This programme has been implemented jointly by the Department of Agriculture and Livestock and the Provincial Government (Division of Primary Industry). Funding for this programme has ceased since 1995 and the programme has been disbanded. The Board has been relying on the ACEDP for funding and development of the agriculture extension and reseach component of the industry.

In brief activities the Board undertook were;

1. To draw up guidelines for the registration of Spice Exporters;

2. Participate in the Port Moresby Show (June), Goroka Show (September) and Morobe Show (October);

3. Assist farmers with technical information, phamplets, etc.,

4. Assist Rarai (Bereina District) spice farmer and Vanapa Spice Project farmers with funds to expand their projects;

5. Eastern Produce Spice P/L (Spice down stream processor) with funds for spice processing;

6. Represent PNG at the 4th Meeting of the International Spice Group meeting held in Colombo, Sri Lanka (23rd-27th September, 1996).

7. Be party to the Memorandum Of Agreement on the Smallholder Agriculture Credit Scheme and screen applications from smallholder farmers for the same.

8. Register industry participants as Exporters as per the requirement of the *Spice Industry Act, 1989*. Todate nine (9) company applications have been screened and recommended to the Board for approval.

9. Investigate and inform the industry members on export market opportunities.

10. Prepare Pre-Feasibility Study Report for the Karamui Spice Project, Simbu Province and the Draft Memorandum of Understanding between the DAL, SIB and Simbu Provincial & Local Level Government to rehabilitate the KSP.

11. Prepare Project Propossal for funding of the Morobe (Munum &Markham Highway) Spice Development Programme.

12. Support for vanilla cultivation and processing graduation ceremony for 223 vanilla farmers in Wosera District, East Sepik Province (21-23rd September, 1999).

13. Carry out study to report to the Board the status of Spice/Vanilla industry in East Sepik Province and recommend development measures (10th-16th September, 1999).

14. Draw up Memorandum of Understanding for the Komo Magarima Spice Development Programme between the Department of Agriculture and Livestock, Southern Highlands Provincial Government and the PNG Spice Industry Board.

7. SPICE DEVELOPMENT ACTION PLAN

In view of the need to develop a potentially large agricultural sub-sector industry in spices with the aim of assisting farmers increase and diversify rural income base, improve basic living standards, generate employment in the plantation and formal sector, increase foreign exchange earnings for the country the spice industry would need to be supported by government. The following action is proposed by the Spice Industry Board for the steady growth of the spice industry.

1. *Intensify Research*

- To select high yielding superior quality varieties.
- To develop suitable agronomic practices to maximise productivity.
- To evolve appropriate control measures for pest and disease.
- To modernize or improve harvest and post-harvest practices.

2. *Launch a Major Development Programme with the Involvement of the National DAL and Provincial Division of Primary Industry*

- To encourage farmers to grow selected spice crops.
- To distribute quality planting materials.
- To train farmers on improved cultivation and processing methods.
- To train extension personnel.

3. *Produce Organic Spices*

- To achieve better value spices.
- To capture markets in selected European countries.

4. *Strengthen and Corporatise the PNG Spice Industry Board*

- To regulate and monitor the spice industry.
- To instigate and or take up production programme in collaboration with the Provinces and Districts.
- To provide market information to processors and exporters.
- To ensure quality and standards for spices exported.
- To give propaganda for PNG spices abroad.

5. *Provide and Support Agricultural Credit Scheme*

- To assist growers take advantage of the Smallholder Agricultural Credit Scheme to meet a part of the cultivation and processing cost.
- To monitor the growers supported under the Credit Scheme to ensure farmers project is successful.

6. *Ensure Marketing Arrangements*

- To help the growers for easy disposal of the product at the optimum price.
- To develop linkages between growers and exporters.
- To support an export drive programme to increase and promote PNG spices internationally.
- Conduct marketing training, seminars, workshops for spice offices, farmers and exporters.

7. *Establish Quality Testing Laboratory*

- To check quality of spices before exports.
- To monitor contamination and further improve the quality of spices.
- To find out biochemical constituents.

8. *Encourage Down-stream Processing*

- To add more value to spices.
- To secure higher unit price.

9. *Look for External Funding Support*

- To launch a major programme for spice development and export.

To develop a viable spices industry in Papua New Guinea the action plan with a development budget would have to be supported by Government. Initially the Spice Industry Board would have to be corporatised, including the re-instituting of the Alternative Crop Expansion and Diversification Programme as an "Extension Arm Programme" for the Board and funding for this to be made available by the government.

8. REVENUE AND BUDGET

8.1 Revenue

The Spice Industry and alternative crop subsector is at the cross road where it is considered as having enormous economic potential but require initial Government support. Recent estimates suggest that PNG has the potential to develop its spice industry into a more than US Dollar 60.0 million per year industry contributing substantially to foreign exchange earnings, creating employment and providing income to rural farmers. However at this stage the Industry has declined from the mid- 1970's high to generate less than K5.0 million in export earnings due to the lack of Government support, fluctuating world prices and ineffective management and marketing.

With the given situation that the industry is small, the Board is in a situation where it cannot generate sufficient revenue by imposing fees/levies, etc., support from the National Government for both the Board's establishment, administration/operation and development programmes is required.

8.2. Development Budget

The Board, through the DAL, submitted a Development Budget Estimate for K1.2 million to the Department of Finance and Planning for government funding in the 2000 financial year. **This Development Budget was aimed at fully establishing the Board with its own staff, office accommodation, office facilities (furniture, vehicles, computers, etc.).** Unfortunately this submission was turned down and not funded. It is hoped that the current Government would support the Budget request this time.

8.3 External Funding Support

In the meantime the DAL and the Board have prepared and submitted the following:

a) A Joint Technical Assistance Proposal for the European Union STABEX funds to support the spice industry and the Board with a study/review of the industry and recommend appropriate development strategies, including funding source, technical support and institutional requirements

to strengthen and develop a viable industry. Through the findings of the study a corporate plan for the SIB will be formulated. It is estimated that this study will require K100,000 to be carried out over a month period.

9. SUMMARY

The White Paper on Agriculture highlights, amongst its commodity policies, the need to encourage the development of appropriate alternative cash crops. Following the government's effort to diversify the country's cash crop base from traditional crops like coffee, cocoa, copra and oil palm and with growing interest in spice crops the *Spice Industry Act, 1989* was enacted by Parliament which facilitated the PNG Spice Industry Board to be established in 1991.

The PNG Spice Industry Board was officially launched in 1991. To-date it is still been looked after by the Department of Agriculture and Livestock (DAL). The Board has its own administrative staff based in Port Moresby, but relies on DAL, through the Public Investment Programme (PIP) known as the Alternative Crop Expansion and Diversification Programme (ACEDP) for the facilitation of field operations. This funding for the ACEDP has been discontinued since 1995 leaving the Board to depend on the provinces to identify and implement their spice development programmes.

The Board functions and responsibilities are prescribed in the *Spice Industry Act*. These include regulating and promoting the spice industry. Unlike other commodity boards, the PNGSIB is responsible for the development of 11 crops.

The PNGSIB is responsible for an industry that has enormous economic potential which can generate foreign exchange, provide employment and generate income for over 28,000 rural farmers. In order to effectively carry out its responsibilities and initiate programmes for which budgetary support from government is required. In line with the current reforms and to promote and develop the spice and alternative crop subsector the PNG Spice Industry Board should be corporatised and financially supported like the other Commodity Boards with its own funds, staff and equipment.

The Board is empowered by the *Act* to impose fees and levies as a source of revenue to facilitate its operations. As the industry is small it would be premature to impose levies at this stage and as such it is hoped that the government will initially provide for the Board the required budgetary support. At the same time a project proposal has been prepared jointly by the DAL and PNG Spice Industry Board's Office and submitted for the European Union STABEX funds and Chinese Government Aid to seek funds to support the administration of the Board and the industry.

RECOMMENDATIONS

* It is considered that the National White Paper on Agriculture be acknowledged and that policy directives on spices and alternative crops be implemented by the government.

* The PNG Spice Industry Board be corporatised as a Commodity Board to effectively address Government Policy directives, its aims and goals, functions and responsibilities as prescribed by the *Spice Industry Act*. In so doing be supported to regulate, monitor and promote a viable spice industry in Papua New Guinea.

* The Spice Industry Board's Development Budget be supported for funding in the 2000 financial year.

* The DAL Public Investment Programme (PIP) known as the Alternative Crop Expansion and Diversification Programme (ACEDP) be resurrected and funded to become the Boards 'Extension Arm'.

PROSPECTS FOR A PAPUA NEW GUINEA LIVESTOCK INDUSTRY (CATTLE)

Gonny Bubar[1]

The Cattlemen's Asssociation represents the interests of small producers and large ranches. Due to lack of time, we will present here a few figures and examples only.

SOME FIGURES

Current commercial meat production is approximately 2800 tonnes beef, sheep nil, poultry 17,500 tonnes and pigs 1000 tonnes.

Total red meat imports are 42,000 tonnes of which 9,000 is beef and 33,000 tonnes is mainly lamb flap and forequarter chops. 90-95% fo the beef imported is trimming and thin flank brisket. This is mainly used for processing at canneries and small goods factories. Approximately 500 tonnes of fresh market beef is imported.

Processing beef is imported tariff free. Imported fresh market beef has a 30% tariff. Imported sheep meat is tariff free. Imported poultry has a K3.15 per kg (approx 70%) tariff. Imported pork has a 30% tariff. While there is scope for production expansion, competition with cheap quality imports is difficult.

WHY CATTLE?

We are continually reminded of the high cost of importing grain to feed poultryand pigs but we should remember that cattle eat grass. There are large areas of under utilised grassland which is suitable for cattle but unsuitable for cropping.

Many of our small farmers are second generation cattle farmers. We have learned from our fathers. PNG is free of major cattle diseases.

SOME HISTORY

The number of cattle in PNG increased to 150,000 head in the 1970s' but this gradually reduced to 70,000 head due to poor market economics and the difficulty of farmers to sell their cattle in the face of cheap imports. An improvement in the market position in the late 1990s restored farmer confidence and as a result herd numbers have increased to approximately 85,000 head.

Fencing is the major infrastructure cost in cattle production and has faced import tariffs of 55% for star pickets and 40% on barb wire. While the picket tariff has since been removed a tariff is still in place on barb wire.

PRODUCTION EFFICIENCY

Production efficiency is measured by the turnoff number and weight of animals on sale. This has shown improvement over the past decade as farmers identify production problems. As an example, the extent of calf losses due to dog attack was little appreciated in the past and where control measures have been used, we see major improvements.

Over the past 5 years the industry has developed the supplementary paddock feeding system with PNG produced by-products: copra meal, oil palm PKE and molasses to supplement pasture and improve quality and profitability. This is a major quality step through improved growth rates and animal handling.

[1] President, Cattlemen's Association of Papua New Guinea, P.O. Box 1535, LAE, Morobe Province.

While smaller farmers can benefit from the technologies developed and introduced by the ranches, they mostly lack the knowledge and facilities to improve their stock in this way.

SOME ISSUES

Beef faces a marketing problem which needs to be addressed by the industry itself. Overall, beef is cheaper than chicken but this not reflected in sales. Possibly more aggressive advertising and product merchandising is needed to improve sales.

The recent tick introduction to the Markham and Ramu valleys required a costly eradication exercise in excess of one million Kina. This cost was faced by the larger ranches. While the Papuan region has learned to live with the added costs of tick, the costs would have been an unnecessary burden particularly on our smaller farmers. This may also explain to some extent the low number of smaller cattle producers in the Papuan region. This exercise proved the need for strong quarantine restrictions. We should note that to protect their industry, our Australian neighbours do not allow the direct import of live cattle under any conditions. With the devastating Foot and Mouth disease now spreading in Asia, we need to be particularly careful with our neighbours who may not practice the same level of quarantine.

INDUSTRY EXPANSION

The aim of the industry is to increase production volume and reduce consumer prices. To do this, the industry seeks a facilitating and support role by government agencies. The available suitable land is on customary land and the focus for expansion needs to be directed to small farmers and landowner companies.

Support for small farmers through extension contracting to privatised agencies and larger ranches will be the most cost effective method. In the longer term, the industry should become self supporting, possibly on a nucleus estate model. This is currently loosely practised with small surrounding farms receiving assistance from larger ranches. As an extension provider, SRPM with its support from both Morobe Provincial Government and RDB was building confidence in farmers until its funding collapsed. While the new ADB pilot program may pickup where the SRPM program faltered, this start - stop - start by government does not give confidence to new small farmers.

The move away from government funded abattoirs with the establishment of the modern Ramu abattoir with full boning facilities serving the wider industry is another example of the industry self sufficiency.

Market stability and protection from import dumping are important. While a protective tariff is unnecessary to compete with the current real Australian prices, it is necessary as meat is being sourced by importers below cost - how? We have such a small market here that small increases in imports brought on by dumping or fluctuating overseas prices greatly affects our market situation and farmer confidence. To stabilise these fluctuations, we need a tariff at this point. It should be noted that the tariff currently affects less than 10% of imports or 15% of fresh market consumption.

Ensure the industry develops on a level playing field. Remove excessive input tariffs and give the same concessional advantages to all sectors. Develop appropriate technologies in pasture improvement, stock management and supplementary feeding for small farmers and provide skills and business training. Research input into production efficiency and cost reduction.

Security / law and order issues - brand register needs to be reviewed and enforced and increased penalties are required for cattle theft and unauthorised movements of live cattle and carcasses. We suggest confiscation of vehicles, business licence etc.

Need access to Rural Credit with extended repayment periods. Need improved road access.

Commercial Production

Beef	2800 tonnes
Chicken	17500 tonnes
Pork	1000 tonnes
Sheep/Goats	< 59 tonnes

Red Meat Imports

Processing Beef	8500 tonnes
Fresh market Beef	500 tonnes
Lamb Flap / Shoulder	33000 tonnes
Poultry / Pork	Nil

PROSPECTS FOR FRESH PRODUCE INDUSTRY

Bob Hargreaves[1]

1. INTRODUCTION

About 85% of PNG's estimated 3.8 million people produce their own food. They also contribute to feeding people in urban areas. This is a major factor in maintaining stability in this country.

Over the years there have been attempts to develop fruit and vegetable production and marketing but they were never sustained. Development initiatives, mainly through assistance from Aid sources, have targeted at resolving certain problems but there has never been a genuine commitment by past Governments to develop the fresh produce industry in its entirety.

The last major attempt was the Marketed Fruit and Vegetable Project (MFVP), a NZ Government assisted initiative established by DAL in the latter part of the 1980s after the failure of the Food marketing Corporation. The Fresh Produce Development Company (FPDC) was established in 1989 to enhance the activities of MFVP. Main funding was provided by the NZ Government. The MFVP had a national outlook but by the early 1990s PNG funding started to shrink and the project started to falter. In 1996 DAL transferred the MFVP to FPDC and the NZ Government started to phase down its funding support to FPDC. FPDC came near to closing down in 1998 because of lack of funding. It survived because the NZ Government once again came to the rescue.

FPDC's funding problem is not unique where the food sector is concerned and I raise this issue not because I am the Chairman of the Board of Directors but because I wish to emphasise that it is time the Government paid serious attention to this country's food needs before we reach a crisis point we can't cope with.

Population growth is around 2.5% per annum. At this rate, PNG's population will be around 8 million in just 30 years. We cannot allow the current level of neglect to continue.

Attending to production matters in isolation of other vital factors is not the way to develop the fresh produce industry. There has to be a concerted effort towards equal and continuous development of all aspects of the industry.

Strategic plans must be conceived for a given period of time, particularly where development is concerned. I would suggest a 3-5 year period, depending on the existing situations. Specific targets must be set for achievement within identified programmes over this period of time. This should assist in planning expenditure, provide the initiative to guarantee funding and provide the basis to plan the next stage of development.

The trend over the past few years has been to provide sufficient funds for government organisations to exist virtually on a day to day basis. This attitude has to change. Funding has to be consistent and to the required amount. Having said that, it is also incumbent on the Government to exercise stringent monitoring measures to ensure its agencies are achieving their declared objectives.

There has to be an effective and positive linkage and interaction between all the organisations and agencies associated with fresh produce at district, provincial and national level.

In comparison to tree crops, fresh produce fares poorly. I would now like to outline some of the factors associated with the production and marketing of fresh produce.

[1] Chairman, Fresh Produce Development Company Ltd, Mt Hagen.

2. PRODUCTION

All food production is basically at subsistence level though in some cases commercial attributes are adopted in one form or another.

Traditional crops are aimed mainly at the informal market e.g. open suburban markets and roadside markets while introduced crops are aimed at both the informal and formal markets.

More and more growers, particularly in high altitudes, are spending more effort and time in the production of introduced vegetables because of their greater commercial value. Some of this class of growers are tending to specialise in one or two crops to earn income and thus may have only limited time for the production of traditional crops. In these instances they may rely entirely on income from their specialist crops to sustain themselves and their families. As this trend grows, the expertise of these growers will need to be enhanced and the marketing of their crops assured if their interest is to be maintained.

Food production is no longer just for household consumption. It is a means of earning an income and for the majority of the country's population this is the only source of income. It is difficult to fathom why committed Government support has always been lacking.

Below are some problems affecting production.

a) High cost of seeds and other agriculture inputs.

b) Predominance of Hybrid seeds over open pollinated seeds on sale (high costs of hybrids and inability to save seeds from hybrids).

c) Very poor condition of feeder roads.
d) Inefficient means of transporting produce from farmgate to market.
e) Expensive packaging (farmgate to wholesale to retail).

f) Difficulty in growers obtaining credit finance (cannot give assurance of guaranteed market like the tree crops).

3. MARKETING

The informal market is less sophisticated than the formal market though substantial losses can be experienced by both.

The informal market is made up of growers selling their own produce as well as those who buy from growers and wholesalers and resell. All transactions are self serving.

Fresh produce channelled through the formal market is principally made up of introduced temperate vegetables. Besides being an income earner, they are also crucial in replacing imports.

Formal marketing of fresh produce was given major emphasis in the mid 1970s up to the 1980s through the Fresh Food Project and later by its successor the Food Marketing Corporation. Both were government owned organisations which perhaps provided the most likely reason for FMC's eventual demise.

The concept was not the reason for the failure, rather the ambitious nature of the project. Operations should have been confined to commercial levels rather than towards providing a national service. By the time FMC tried to rationalise its functions, it was too late. The worst part fo the exercise was transferring assets of FMC where they existed to Provincial Governments in the hope that they would become more efficient and thus profitable.

Where Port Moresby was concerned, air freighting fresh produce from locations in the Goilala area proved ineffective and costly. The alternative of providing a road service instead of facilitating transport of produce from as far as Enga and the Southern Highlands Provinces to Lae and on to Port Moesby, was never considered. It doesn't appear to be a consideration even now and yet it remains the closest source of potential supply to Port Moresby.

The private sector tried to pick up the pieces but in the end only one entrepreneur persisted. There are now a few more firms dabbling in the wholesale of fresh produce but this section of the industry still remains inefficient and at times a hindrance to production.

Stop 'n' Shop and Anderson's Foodland Supermarkets are the only retail outlets that give emphasis to local fresh produce. Others do not appear to be interested in retailing fresh produce to any great extent.

Imports of fresh produce are still a major hindrance to the marketing of local produce but the sensible way to go about combating this factor is through providing the right assistance continuously and having the appropriate infrastructure in place instead of resorting to import bans.

An import ban may have the following effect.

a) Deter the establishment of necessary infrastructure because in the absence of competition it could be viewed as unnecessary.

b) Increase in price of fruits and vegetables in the formal market. Price increase in the formal market could in turn impact on prices in the informal market, particularly in Port Moresby.

c) Quality of produce may not improve substantially.

d) Growers will suffer because wholesalers/ retailers will be selective in what they buy if quality is a problem.

e) Wholesalers may not be concerned about improving their efficiency.

The bulk of temperate vegetables are produced in the highlands region and the biggest markets are Port Moresby and Lae. The quality of vegetables, particularly to places such as Port Moresby and Rabaul, are very much affected by the way they are handled, packaged and transported.

The supply of fresh produce to Port Moresby by sea from Lae and air from the highlands rose from1,000 tonnes in 1989 to 6,4447 tonnes in 1998 and dropping back to 5,000 tonnes in 1999. There were rises and falls in interventing years. Figures from the FMC days are not available to make comparisons.

The potential to supply greater volumes of highland produce to Port Moresby and other ports exists. The problem is the ability to get them to their destinations in an orderly fashion, ensuring quality and price competitiveness is maintained.

Below are some of the problems associated with formal marketing.

a) Inefficient wholesale depots or lack of them.

b) Lack of refrigerated containers to store produce for transportation.

c) Lack of support from trucking and shipping companies because of the lack of appropriate infrastructure.

d) Unreliable and expensive airfreight service (combined road and sea freight to Port Moresby from Mt. Hagen is about 0.45 toea per kilo compared to between K1.50 and K2.00 per kg by air).

e) Lack of proper facilities to consolidate produce in Lae and to disperse the same on arrival in Port Moresby.

f) Expensive packaging.

g) Poor condition of the Okuk highway.

4. OTHER ISSUES

There are other issues I would like to touch on briefly.

(a) Food Security Programme

With the devolution of powers and decentralisation of functions, I feel it is necessary to have a National Food Security Programme in order to have and maintain a united focus on food issues nationally.

However I would insist that we get back to basics if we are to ensure this programme serves its purpose. For instance we need to;

i) Enhance production of traditional crops throughout the country.

ii) Preserve and ensure the survival of traditional food crops by retaining them in germ banks.

iii) Ensure planting materials of a wide range of traditional food crops are maintained in selected locations for emergency supplies.

iv) Because of the high cost of seeds, particularly hybrids, coupled with the low income of subsistence farmers, it is necessary to sustain the supply of open pollinated seeds of selected crops such as corn either through in-country production or through imports.

While the presence of Hybrids seeds is a fact of life, they cannot be allowed to dominate the seed market completely. The ordinary person cannot afford them. It is therefore incumbent on the Government to ensure the people have access to affordable seeds.

v) There has to be constant dialogue between all levels of Governments and their respective institutions and agencies and with relevant NGO's and not least the farmers. Planning and implementation has to be at the guidance of those who are meant to benefit.

It goes without saying that the Food Security Programme must address all issues relating to both the informal and formal sector.

(b) Export

For far too long emphasis on agriculture has been confined to the tree crops. It is now time to put fresh produce on the export agenda.

The New Zealand Government has made the right overtures and this should be pursued to the fullest extent.

(c) Statistics

PNG has a very poor reputation in keeping up to date records of vital statistics and information. Just on the fresh produce aspect alone, there are no indications of what the country is producing on a district, provincial and national basis, what is being marketed through the informal and formal markets nation wide, what the main consumption crops are in the different provinces and districts, even areas, and statistics on imports of fresh produce are way out of date.

Someone has to be given charge of compiling agriculture statistics. Funding has to be guaranteed so that this task is undertaken efficiently and expeditiously.

(d) Training

Training is an integral component of any development strategy. Technology is advancing so rapidly these days that if PNG does not attempt to keep up with basic changes then it deserves to be left behind.

The Government must provide the means and incentives to its Institutions and Agencies to initiate training for their clients and staff.

(e) Participation of women in Food Production and marketing

There is no need for me to go to any great lengths to espouse the contribution that the women make to this country's food security, not because I am male but because it is all too obvious that women are are the main

providers.

All I need to say is that the Government must ensure that it takes the needs of women into account when formulating its food policies. If this means locating women at policy level and enhancing their role in planning and implementation, then so be it. The obvious point is that if the capabilities of women are not enhanced, then who is going to sustain this country's level of food production.

(f) Funding

The attitude of Government towards funding fresh produce initiatives must change. It must view this sector as vital to this country's peaceful existence and prosperity.

The Government must adopt a positive attitude towards lessening its dependency on aid to fund its food based programmes. It must take full control of its financial responsibilities in a sustainable manner. Continued dependency on aid lulls the government into a false sense of security, thinking it has the matter under control when in fact it hasn't. Situations just continued to deteriorate.

As mentioned earlier, 85% of this country's 3.8 million people survive from their own efforts in feeding themselves and their urban cousins. Surely it is not impossible for the Government to make a genuine effort to help its own people to look after themselves.

I thank you for giving me the opportunity to express my opinions on behalf of my community, the subsistence food producers of this country and the organisation I represent, the Fresh Produce Development Company.

QUALITY CONTROL IN AGRICULTURAL INDUSTRY

Daniel Takendu[1]

WHAT IS QUALITY CONTROL

Quality control is a procedure aligned in any agricultural production establishments to either monitor the correct implementation of the quality assurance system, provide an early warning of product deviations or departures from quality assurance system; detects errors or faults in processing equipments, facilities and procedures; and to ensure that the total quality system is working as intended. Therefore quality control in any agricultural production involves all operational techniques and activities from production of produce such as cash crops, fruits and vegetables, harvesting, processing, packaging, storage and transportation chain, and at each operational stages quality control functions are undertaken to ensure that the quality system within the establishment is working as intended and the end product fulfils the requirement for quality.

In any given agricultural production establishment, quality control systems would rely very heavily on end product inspection and testing, the aim being to reduce the number of defective products reaching the market place. The quality of end product is inspected against known consumer or importer's specification and the end product, is either released for sale in markets, reprocessed or discarded.

A quality control program does very little, if any, to prevent production of defective products. The major faults with this approach are firstly, that defective products are still produced and reach the market. Secondly, value is added to the product at each step in the process and it is the valuable finished product that is being rejected or reprocessed. This is costly for the industry. For instance, harvest of immature or over ripen (rotten), germinated nuts, insect infested and diseased produce when processed into finished goods may never get to land in the market places. Therefore harvesting of fresh produces should be timely, harvest only mature, clean, wholesome (hygiene and purity), and pests and diseased free, for processing and the processor must have an efficient processing facilities to produce the desired finished product. Harvest of defective produces must be eliminated as much as possible. Defective produce undergoing through the processing line gains value added to product at each phase of product development and the valuable end product may not satisfy the market requirements. Harvest of perishable for marketing must be conducted timely and proper storage is vital to determine the shelf-life, the keeping qualities. It is therefore very essential, to decide on what desirable qualities a produce should have prior to undergoing a manufacturing process.

Agricultural establishments processing a single product with high performance rating may present a low risk to product quality, would therefore anticipate low priority. Conversely, an establishment processing many products with poor performance rating may poise for a high risk to product quality therefore stringent quality control measures must be aligned to detect faults in any steps in the manufacturing process. Management practices, product design, consumer requirements and plant health requirements for overseas marketing will influence the quality control programs that are aligned into each phase of production from harvesting of produce to finished product line.

NAQIA'S POLICY ON QUALITY CONTROL

Quality control is an issue, which has been left to

[1] Chairman, Board of Directors, National Agriculture Quarantine & Inspection Authority, Port Moresby.

various industries to absorb and police by undertaking all necessary actions to safeguard their interest and to ensure that quality of their product for export purposes, is achieved. NAQIA being a facilitator to international trade will ensure that all goods for exports comply with World Trade Organisation (WTO) trade guideline, and will provide confidence building, quality assurances and acceptance of goods for exports. The Authority under *NAQIA Act 1997* has the following mandated regulatory functions and responsibilities on quality assurance and certification system, and they are:

1. Conduct product assessment for export qality and issue product certification for export;

2. Issue Phytosanitary Certificate for export consignment;

3. NAQIA Inspectors ensure that export consignment comply with legislated quality standards as set out under commodity Acts (coffee, copra, cocoa etc.);

4. Monitor, inspect and control the export of agricultural produce and related products to ensure that they are free from pests, diseases, weeds and any other symptoms;

5. To undertake all necessary actions to ensure that the export of agricultural produce and related products are free from pests, diseases, weeds and any other symptoms so as to provide quality assurance to meet the import requirements of importing countries;

6. To issue permits, certificates and endorsements pertaining to imports and exports of agricultural produce and related products that they are free from pests, diseases, weeds and any other symptoms, and

7. To inspect and treat vessels, aircraft, vehicles, equipment and machinery, that are used for importing and exporting agricultural produce and related products to ensure that they are free from pests, diseases, weeds and any other symptoms.

NAQIA 'S ROLE ON EXPORTS

The National Agriculture Quarantine and Inspection Authority is the sole agency mandated with regulatory function to perform product quality assurance and certification for export. The Authority will monitor, inspect, control and undertake all necessary actions to ensure that our agricultural produce and related products for marketing are free from pests, diseases, and weeds and any other symptoms so as to provide quality assurance to meet the consumer's requirements and plant health authorities of importing countries.

The Authority through regulatory (quarantine and inspection) roles promotes and is committed to quality assurance as it facilitates international trade, ensures importing country requirements are met, and strives to fulfill public health requirements. The Authority will ensure specific criteria of export quality on our agricultural produces for exports such as cocoa, coffee, copra, palm oil, rubber or other plant products are achieved through sound inspection and quality standards and certification procedures. Achieving quality standards on our agricultural produces would ensure that our exports conforms to World Trade Organization trade principles and guidelines, and thus attract a better market opportunities for our export goods. NAQIA will continue to provide certified assurances that the country's product complies with the country's legislated quality standards that consumer's requirements are satisfied and the consumer's quarantine entry conditions, which include compliance with overseas standards are met.

Taking on export of cocoa, coffee and copra for an example, on every presentation of these products for export, a Quarantine Officer under the supervision of a Senior Quarantine Officer will conduct product inspections, assessment for quality of product and make recommendation for acceptance for market (exports). The quarantine inspection procedure involves examina-

tion on arrival for conditions of containers (bags) used, carriage hold; presence of dirt (mud/soil); insect pests adhering to the exterior of the bags, appropriate markings and labeling (product name and grade) on the bags/containers. A representative samples are drawn and the drawn samples are further examined for presences of foreign matters, insect pests and state of product. The samples are then assessed for quality either visually or aided by employing machinery or equipment to determine product quality against established standards as prescribed under the relevant commodity act. Once the quality assessment conforms to standard and all requirements are satisfied, the consignment is accepted for exports. A Phytosanitary certificate is issued to declare the goods freedom from all injurious pests and diseases and is now ready for export shipment.

ROLES OF OTHER SERVICE REGULATORY BODIES

Functions like Consumers Affairs Council (CAC), National Capital District Commission (CDC), National Institute of Standards and Industrial Technology (NISIT) and Department of Health (Role of Food and Sanitary Act) have a part to contribute in maintaining national quality standards and quality assurances on the services or movement of goods into or within the country. CAC can join forces with NCDC to ensure service industries are complying to minimum national standards on Food and Sanitary. While NAQIA is maintaining quality control on imported goods to ensure freedom from exotic pest and diseases, it is Department of Health, NCDC and CAC through their combined efforts can monitor quality assurances on the entry of all consumable goods and that servicing agents are operating within national Food and Sanitary Act. The Department of Health must continue to ensure that all entries of consumer goods satisfy legislated health quarantine requirements. The Health Department together with NCDC must ensure that all food processors either for markets in the country or overseas must operate within the principles and guidelines as set out under the Food and Sanitary Act. Establishment of critical hazard control points system at each food, processing unit will necessitate for product conformances and safety.

It is vital that NISIT must resource from their standards library and consult NCDC, CAC and others on the development of standards on quality controls and quality assurances management systems as well as educating servicing agent on in-house quality control programs appropriate to activities performed at each establishment. These Service Regulators in-turn do require appropriate resources and therefore must be supported to enable them to continue to function properly.

QUALITY CONTROL ON EXPORT CROPS

Quality standards for agricultural export commodities are established to comply with legislated grade standards within Papua New Guinea and with overseas plant health quarantine and market requirements. The quality standards are specified under relevant commodity acts like the *PNG Coffee Act 1980, Copra Act 1984, Cocoa Act 1982* etc. These standards rgulate the minimum acceptable physical and Phytosanitary (plant health) conditions, which the producer/exporter must meet, for market acceptance.

The management practices within the industries, provide the protocols one must adhere to when conducting production for marketing. And, at the end of the process, finished products must meet prescribed national standards. For instance, in the production of copra, let us take a single step for consideration like the copra drying process.

During drying of crops, the dryers has to be well venilated to ensure smooth transfer and distribution of heat and if otherwise the product will result in either being burnt or "un-cure" and that will have a deleterious effect on the marketing quality of copra. Or cocoa and coffee beans not agitated during the drying process would lead to development of cold and hot spots and on mixing

of beans that would promote mouldy growth, which would deter the quality of beans. Given these examples, the appropriate act specifies what exact control measures are to be taken in each case to ensure that at each developmental stages product gains added value in quality and tries to as much as possible to eliminate factors that would deter quality of the finished products.

As in the case, of perishable goods, the product quality aspects of it rests very much on the importer's requirement and by arrangements, the exporters are to comply. With the perishables, timely harvests and due post harvest care and attention with regard to proper packaging and storage would warrant a prolong shelf-life.

PRODUCT QUALITY

Achieving quality on product is an end result of a concentrated effort and is achieved when features and characteristics inspected and tested on end products for marketing that bear on its ability to conform to stated requirements for quality. The features and characteristics vary between products however, the generalised product quality attributes are flavour, odour, wholesome, colour, purity, consistency, weight, shape and size, and moisture contents of products, and product's freedom from presence of foreign matters and product derived debris. These attributes are achievable targets and can be checked against known standards of the same product. In addition to product quality, packaging must meet legislated standard for quality and marking.

QUALITY STANDARDS ON EXPORTS

Quality of products for export will be examined/ assessed by NAQIA and product assessed conforms to minimum national quality standards and plant health requirements of the importing country would be passed. NAQIA will also ensure that the products are produced in accordance to prescribed quality standards under relevant commodity Regulations within the Act. NAQIA will advice industry on overseas Phytosanitary (plant health) requirement that may vary between importing countries and may be subject to change depending on the pest and disease status of plant produce and related products within PNG.

MARKET REQUIREMENTS

As the volume of marketable agricultural products and related products increases, there is a continued need for market access. To maintain market demands and attractions, the growers must be encouraged to continuously cultivate crops to produce yields of acceptable standards of quality, purity and hygiene. The processor must have an effective and efficient product manufacturing process. Produce for processing must meet processor's specification (maturity, wholesome, cleanliness) and must be free from pests and diseases, and other defects.

Industry must establish an effective quality control procedure and placed in each process steps from growing, harvesting, processing, packaging, storage and transportation to achieve quality assurance and certification on product intended for export. At the same time, set up an effective up to date and maintain communication with buyers on their requirements and regulations governing entry of export product into importing countries

There is an increasing demand on the markets for products, which are organically grown and processed compared to products where a lot of chemical fertilizers, weedicides and pesticides are applied. Consumers all over the world are nowadays conscious of chemical residues in product and they are preferred to pay for goods or products that are organically, processed and tested. A lot of the Papua New Guinean produce comes from many smaller holders or individuals where there is no usage of chemicals of any kind. Large plantations may have had the use of chemical substances at some stage of the production. Policy issues on the organically, grown produce must be developed by

National Agriculture Research Institute (NARI) and the affected industries. Within the policy developed, the industry will be better able to regulate and set up quality control procedures to ensure product conformance to market requirement and take advantage of the market opportunity for the organically grown product.

PLAYERS IN QUALITY CONTROL

The major players in maintaining and promoting quality control systems within industry are the growers, processor, exporters, provincial Department of Agriculture, commodity boards and NAQIA. Each player has a defined role to perform to enhance sustainability in production of quality products, which will meet market requirements.

The **growers or farmers** must know and be able to produce healthy, wholesome and pest and disease free agricultural produce, which are suitable to processor or manufacturer's specification or the consumer.

Processor has to make sure that produce received for processing is of the desired quality. The processor must ensure that correct manufacturing technique is applied to enable production of end product, which will meet quality specifications. The processor must appoint a competent quality control officer whose vital task is to ensure all incoming produce meets specifications for processing and regularly monitors the various processing stages to ensure product development conforms to required specification before presenting the finished product for inspection an assessment for sale in markets.

Exporter must ensure that the product for which requires certification complies with legislated quality standards and overseas plant health and market requirements; provide products specification to buyers or supply produce specification to growers.

The **commodity board** under the respective acts is to administer registration of processors and exporters and thereby regulate the produce brought in for processing, processing methods, product quality, storage, marketing access, transportation chain and marketing of end product; has the power to regulate the sale of produce (product) that fails to comply with prescribed minimum quality standards; and offer technical advice to the industry to sustain production and product quality.

Provincial Agriculture Department through extension must offer sound extension advice to farmers and producers on efficient procedures on growing and processing of produce to achieve export quality standards. National Institutions like Cocoa and Coconut Research Institute (CCRI), Coffee Research (CRI), National Agriculture Research Institute (NARI) and others involved in the industry through their extension programs must disseminate research findings and offer sound technical advice to growers on how best the growers could improve and sustain production of quality yields.

NAQIA will ensure that all end products are inspected and assessed to determine fitness for market or export complies with national legislated product quality standards and packaging requirements by consumers or importers overseas. That all products passed for export markets comply with plant health requirements of the importing countries and to provide necessary certification an assurances that the product is of export quality standard.

ECONOMIC IMPORTANCE OF QUALITY CONTROL

Product Quality

Competition on worldwide markets is ever increasing especially with the same export crops being produced in other tropical countries and in far larger volumes than Papua New Guinea. However, production of larger volumes usually involves mass production for quantity but not for quality. Papua New Guinean produce being produced on small

scale involving smaller volumes and in instances, where personal touches are applied, the product should excel in quality. If quality of agricultural product is poor then this would not attract markets and the industry as a whole and the country suffers economic gains. Therefore if our produce (products) is to attract a better price then quality of our export goods is of paramount importance and this cannot be over-emphasized nor denied.

Trade Facilitation

In the past, goods were quarantined for zero or no risks of pest and diseases associated with imports goods and thus, this has been phased out by WTO. Under the WTO agreement all quarantine services of the member countries are obliged to accept movement of goods with some risks. This, then places even greater risks on our imports and would cause us to draw as much as possible of our limited resources to monitor and control entries of pests and diseases. This Authority being a facilitator to international trade will ensure that no risks are exported or imported through our exports and imported goods, respectively. NAQIA has in the past, and will continue to maintain that PNG is free from exotic pest and diseases but there is no guarantee that a hundred percent of the risks involved would be controlled.

Quarantine Lessons

Illustrating on some past incidents of economic importance, like the outbreak of coffee leaf blight (rusts) in the Highlands Provinces that cost the Government nearly two million kina to eradicate. The cattle tick problem in Markham Valley, Morobe Province, which required a lot of funding for the eradication and much needed financial support came from the industry. And, more recently in Manus where there is a reported case on outbreak of an unknown disease on poultry. NAQIA moved swiftly to establish the causes and has, thus confirmed the outbreak and is now considering ways to control the disease. The new castle disease outbreak in NSW, NAQIA in collaboration with Australian Quarantine Services acted fast to ban imports of poultry products from NSW.

Failing to take effective and timely control measures would simply mean that our country would face a major disaster that would harm and cause our agricultural industries to suffer with even greater losses. It would cost our country millions of kina just to address whatever the disaster may be before the industry or the smaller sectors are able to recover. Without quality control and monitoring of movement of all goods, the detection and identification of the threat to industry such as the coffee leaf blight (leaf rust), cattle tick or the discovering of the new castle diseases on poultry would almost be impossible. Therefore ongoing quality control services provided by NAQIA and other regulatory bodies must be recognized, appreciated and appropriate resource inputs given to assist its continuance and further support the improvement and developmental program plans.

Industrial Support

In the country, industries have a lot to contribute to maintaining quality control over their own activities and equally supported by relevant regulatory bodies to ensure productivities continue to maintain quality and maintain our status in the open markets. All regulatory bodies within the industry must perform their mandated functions to ensure that participants especially the small holders are given the freedom to go about conducting their businesses normally.

RECOMMENDATIONS

Implication of Global Trade

The phasing out of zero risks exerts even more pressure on our quarantining roles. This simply means that we have to accept even greater risks on our imported goods.

This Authority can monitor, inspect, control and undertake all necessary actions to ensure minimizing the risks of pest and diseases on imported goods but cannot do it alone. Government must provide needed resources to the Authority to enable her to continue to perform a very vital role in the prevention of exotic pest and disease from entering our shores.

Collaborative Efforts

It is seen that each National Institute like CRI, CCRI, NARI and NAQIA, has a specific or vital role to play in the Agricultural Industrial Services. Should there be a major outbreak of pests and diseases in the country, it will mean that our small holders will be the ones to be affected most. It would be even difficult to contain the outbreak due to the country's rugged pockets and isolated terrains and would cost the government millions of kina to just control the outbreak. At the same time, the Government may have the capacity to feed her populace for just one day but not for 364 days. It is therefore critical that Government must ensure that each Institution is capable of performing its mandated functions by providing and resourcing needy inputs.

Resourcing Departments

Provincial Government Departments of Primary Industries needs to have sufficient budget for extension and marketing, Commodity Boards and Agricultural Institutions alike should be given the budget each requires to perform their regulatory functions. Also, the establishment of Spices and Rubber industries must be on sound footing to enable regulation, monitoring and control activities within the industry. The horticultural (fruit and vegetable) industry, Fresh Produce Development Corporation requires realistic support from the government to enable the industry in her attempts to achieve a trade balance on the imports of fruit and vegetables.

Impediments

Achieving quality on our products are further constrained by lack of transportation facilities, rural infrastructure, rural communication and extension services and these would require government support through the normal public service mechanisms or through the organisation developmental budgets.

Conclusion

NAQIA has Corporate Plans and is charging for the services the Authority renders to the public. The raising of this revenue enables the Authority to stop waiting for Government handouts and continues to conduct normal business in undertaking all necessary actions in the prevention of exotic pest and disease from entering or going out of the country. The Authority, however requires developmental budget support from the Government to assist develop her plans to facilitate for improvement of delivery of services to customers, business houses and maintain linkages with institutions, alike and the industry.

For more information, you can contact:

The Export Program Manager
National Agriculture Quarantine and Inspection Authority
P O Box 741, Port Moresby

Telephone: 311 2100, 325 9977; Fax: 325 1674, 325 9310

Location: Tropicana Building (opposite Bank of South Pacific), Racecourse Rd, Waigani

SMALLHOLDER AGRICULTURE CREDIT SCHEME

Richard Maru[1] & Caspar Auntari[2]

ABSTRACT

The purpose of this paper is to brief the stakeholders at the NAC on the implications on rural agricultural lending, by the decision of the Government, to corporatise the Rural Development Bank Limited, in 1998. The paper also provides a review of the SAC Scheme since implementation in 1997. The key objective of the review is to highlight the key lessons learned from the perspective of prudent fund management by the Bank and to suggest policy recommendations to the NAC to strengthen and improve the performance of the SAC Scheme, to achieve the objective of self - sustenance of the revolving fund, in the medium term.

The paper seeks a resolution from the delegates at the NAC Strategy Conference to secure an NAC resolution to support a joint submission by both DAL and RDB to seek an additional seed capital from the Government of K20-K30 million in the 2001 PIP to allow for further lending under the SAC Scheme. The paper further recommends the soliciting of donor funds for seed capital for the SAC Scheme, for exclusive lending to women under the theme of pursuing gender quality in business opportunities, in the smallholder agriculture sector.

IMPLICATIONS FOR RURAL AGRICULTURE LENDING BY THE RURAL DEVELOPMENT BANK UNDER CORPORATISATION

Background

The Government decided to corporatise the Rural Development Bank in 1998, under the current privatisation strategy. The decision has wide ranging implications for both the Bank and its key stakeholders, especially farmers in the rural communities.

While the mission of the Bank is to provide affordable financial services for the balanced development of the national economy and the advancement of the indigenous population of PNG, the Government ceased providing annual grants to the Bank, to subsidise the cost of providing cheaper and more accessible banking products and services.

Without operational subsidy the Bank was forced out of necessity to redefine the vision of the Bank. The new vision of the Bank is to position itself to be a viable and self-sustaining Development Finance Institution.

Without sufficient annual profits and adequate cash flow to meet all its operating cost, and sufficient loanable funds to lend each year, the Bank could not survive.

The development role of the Bank, is no longer congruent with the overriding survival objective of the Bank. Strategies were formulated and are being implemented to improve the liquidity position of the Bank, ensure profitability to secure the financial and operational viability of the Bank.

The overriding survival objective of the Bank, has and will continue to have wide ranging implications in the ability of the Bank to continue to play its development role especially in the agriculture sector.

[1] Strategic Planning, Rural Dev Bank Ltd, Port Moresby.
[2] SAC Coordinator, Rural Development Bank Ltd, Port Moresby.

The following are some of the strategies the Bank has and will continue to pursue to improve the liquidity and profitability of the Bank.

Cost Reduction

The Bank has reduced staffing cost by reducing staff from 470 in1994 to 210 in 2000, including the reduction of expatriate employees down to only one in 2000. The sale of surplus assets including the sale of houses under the new staff home ownership scheme, will reduce maintenance cost and bring in much needed cash income to improve the liquidity of the Bank.

The profit centre concept was introduced resulting in unprofitable branch operations like Lorengau, Vanimo and Kerema closed to reduce cost.

Increase in Interest Rates

To generate increased income and profitability, interest rates of the Bank were also reviewed with agriculture interest rates increased from 10% to 15%. Commercial and industrial interest rates were also increased to rates similar to commercial banks.

Loan Portfolio Composition

The loan portfolio composition is changing with more and more emphasis on commercial and industrial loans. These sectors attract much a higher rate of interest rate and are less risky relative to agriculture loans.

Quality of Loans

There is a major drive on quality lending with the priority customer strategy of lending to previous customers with good repayment records, aggressively pursued.

Deposit Mobilisation

The Central Bank has declined the application of the Rural Development Bank for a partial banking license to commerce deposit mobilization by accepting deposits even on a pilot basis. The industry and the Bank should consider a joint collaborative approach to deposit mobilization from farmers, to provide essential capital to lend to farmers.

Arrears Revovery

The Bank embarked on its most comprehensive arrears recovery program this year, with 4 additional staff employed as dedicated Arrears Co-ordinators in the four regions, along with the assistance of a JICA expert, to assist the Bank on recoveries. The results up to June 2000 has shown a significant improvement in arrears recovery.

Establishment of Credit Schemes

With the emphasis on commercial and industrial loans, the Bank will reduce its loanable funds over time, for the agriculture sector lending. The Bank needs to pursue more credit schemes with external seed capital for exclusive lending to the smallholder agriculture sector, as no other Bank has the experience or the commitment to lend to smallholder agriculture sector in our rural communities. The long-term sustainability of the SAC Scheme is being pursued by the Bank, to provide continued lending to the sector, without which there will be no accessible loan funds and hence the cessation of the flow on benefits to the rural families and the national economy.

The Bank is and will continue to lend more and more of its limited loanable funds to the commercial and industrial sector to achieve its vision of a self-sustaining Bank, at the expense of reduced lending to the agricultural sector in future.

The sector will have to take the responsibility to partner the Bank to continue with facilitating agriculture lending, by assisting the Bank secure additional seed capital for the SAC Scheme, until such time the revolving fund under the SAC Scheme is self-sustaining.

MAJOR IMPLICATIONS

Major implications for the Agriculture sector, as a result of the new vision and the revised strategies, the Bank is now pursuing include:

Reliance on Commodity Agencies

The Bank will rely on commodity agencies to provide all extension, loan processing and credit management especially securing loan repayment from farmers. The Bank role in the SAC Scheme will be restricted to loan administration and the SAC fund management.

Reduction in Provincial Operations

The Bank has reduced its national presence and will not be able to support many smallholder farmers or the agriculture sector in Provinces where the Bank does not have a presence. The Bank will depend on commodity agencies to establish a presence to be able to assist with the smallholder sector in those Provinces.

Reliance on External Seed Capital

Without Government budgetary support the Bank will rely on the sector to assist the Bank secure seed capital, to enable the Bank to continue to provide cheap and accessible credit to our rural farmers.

Table 1. Subsector Seed Capital Allocation

Commodity	Seed Capital	%
Coffee	2,800,000	28
Cocoa	1,400,000	14
Oil Palm	1,200,000	12
Coconut	1,200,000	12
Livestock	1,000,000	10
Food Crops	1,400,000	14
Spice	500,000	5
Rubber	500,000	5
Total	K10,000,000	100

REVIEW OF THE SMALLHOLDER AGRICULTURE CREDIT

Background

Agriculture supports the livelihood for more than 85% of the total PNG population, which live in rural areas. The smallholder agriculture sector contributes an estimated at 80% (K800 million) of the agricultural export earnings annually.

Inspite of the vast available land and labour as input, resources many rural villages have not been able to become active participants in the development of the national economy.

The bulk of our potential village-based businessmen and women who are willing and able to participate in the cash economy, to improve their livelihood and contribute to national development, do not have adequate access to rural credit. These potential businessmen and women are unable to provide security of a type or in an amount, which normal commercial banks would, in their normal cause of business require.

These village-based enterpreneurs have been restricted from entry into the cash economy because of inadequate access to rural credit.

The opportunity cost is increased production and exports from the smallholder sector.

Those who already have tree crop smallholder blocks have had no structured program for rehabilitation, to secure increased production, hence the provision of very cheap and very accessible seed capital, under the SAC Scheme is a very strong incentive for the various commodity bodies to encourage farmers in the rural areas, to engage in rehabilitation which will significantly boost future export earnings from our tree crops.

In recognizing credit access as a key constraint, the government allocated K10 million seed capital in 1996 to establish the Smallholder Agriculture Credit (SAC) Scheme, in order to revitalize the smallholder agricultural sector in Papua New Guinea. (Table 1).

The SAC Scheme comes as an integrated package, which consists of: credit finance, extension and other support facililties. The scheme also combines the resource available within the Rural Development Bank (Bank), Department of Agriculture and Livestock (DAL), and various commodity agencies to maximize the benefits arising from the scheme.

In order to ensure effective implementation of the scheme and to minimize the risk of project failure, a Memorandum of Agreement (MOA) was executed by the key implementing partners DAL, RDB and various Commodity Agencies.

The DAL has overall control of the scheme in terms of coordinating and sourcing of further funding for the scheme. The Bank is responsible for managing the funds; administer viable loans and receiving loan repayments, whilst the respective industry bodies and their affiliates are responsible for identifying and appraising viable projects, recommending viable projects to the Bank for decision and ensuring continuity of extension support to the approved projects.

The SAC Scheme operates on a revolving concept, thereby the principal portions of loan repayment are reinstated back into the fund to assist more borrowers.

Commodity Agencies are also responsible for credit management, with the Bank role reduced to accounting support for debt recovery, under the SAC Scheme.

The fund is also structured in such a way that the income generated from the deposits of revolving fund will be adequate to meet cost associated with subsidized interest rates and defaulted loans.

The maximum loan amount for any one project is K10,000 and a subsidised interest rate of 5% is charged to borrowers. The difference between the Banks usual lending rate and the rate charged to borrowers are taken from the revolving fund to cover the operational cost of the scheme.

OPERATIONAL PERFORMANCE

Lending statistics as at 30/06/2000 are summarized in table 2.

Table 2. **Lending statistics of the Bank.**

Number of Loans Approved	K 3,116
Value of loans approved	K10,038,986
Total Disbursement since inception	K 8,984,944
Total Repayments since inception	K 1,856,392
Outstanding Loan Balances as at 30/06/2000	K 7,481,865
Total Arrears Balance	K 2,208,448
Arrears %	29%

Loan approvals for various commodity sectors are summarized in Table 3.

The Bank has since implementation in 1997, approved 3,116 loans as at 30/06/2000 valuing more then K10 million and disbursed over K8,9 million already to SAC Scheme loan beneficiaries.

The Bank has committed more then K10 million as loan approvals to 3,116 small holders as SAC Scheme loan beneficiaries.

Coffee is leading other sectors in lending, whilst Spices and Rubber experienced low lending for the reason that there has been no extension arm to facilitate lending to those sectors.

Total repayments collected since inception is more then K1,8 million. On current trends, collections should reach K2 million by December 2000.

There has been significant improvement on Cocoa repayments from deficit cash position of K60,000 in January to a surplus cash position of K7,000 as at 30/6/2000.

Table 3. **Loan approvals (*in Kina*) for various commodity sectors.**

Commodity Sector	Number of Loans	Value of Loans	Average loan per farmer
Coffee	793	2,017,327	2,544
Cocoa	684	2,384,631	3,486
Oil Palm	384	1,692,074	4,406
Copra	468	1,490,206	3,184
Livestock	525	1,391,240	2,650
Food crops	215	935,541	4,351
Spices	23	123,828	5,381
Rubber	1	4,139	4,139
	3,116	10,038,986	2,246

Table 4. **SAC Repayments (*in Kina*) - By Sector.**

Year	1997	1998	1999	2000 6mth	Total	%
Coffee	3,338	49,308	235,361	41,827	329,834	17.8
Cocoa	2,323	85,840	282,419	138,250	508,832	27.4
Oil Palm	182	40,366	178,591	93,638	312,777	16.8
Copra		43,991	137,521	69,860	251,272	13.5
Livestock	162	103,282	190,987	46,119	340,550	18.3
Food Crops		17,960	70,658	18,936	107,554	5.8
Spices			4,138	1,360	5,498	0.3
Rubber						
Total	6,053	340,747	1,099,574	410,018	1,856,392	100

REVOLVING FUND

The cash position of the various commodities as at 30th June 2000 is summarized in Table 5.

The total fund available in the revolving fund as at 30/06/2000 is K5.54 million. However these balance will be depleted by December 2000 should disbursements be made for applications already approved.

The revolving fund urgently requires an injection of significant seed capital, to sustain lending under the SAC Scheme.

The relatively high balance in the revolving fund, despite disbursement of K8.98 million out of the total of K10 million seed capital is largely attributed to the high interest income earned by the Bank by reinvesting surplus funds in short term money markets.

A total of K4 million has been earned in interest income, without which there will no longer be funds for lending under the SAC Scheme because of both the high arrears by some sectors

Table 5. **Cash positions (*in Kina*) of various commodities.**

Commodity sector	Seed Capital	Cash Position as at 30/06/2000	% Seed Capital Utilized	% Seed Capital Available	Status of fund
Coffee	2,800,000	1,672,796	40	60	OK
Cocoa	1,400,000	7,320	99	1	CRITICAL
Oil Palm	1,200,000	885,045	26	74	OK
Copra	1,200,000	427,466	64	36	CRITICAL
Rubber	500,000	685,791	-37	137	OK
Spices	500,000	589,382	-18	118	OK
Livestock	1,000,000	179,234	82	18	CRITICAL
Food Crops	1,400,000	1,094,326	22	78	OK
Total	10,000,000	5,541,360	45	55	OK

like livestock and the extended grace period for most tree crop commodities, who come into production after more than three years after planting (coffee, cocoa & Oil Palm).

EMERGING ISSUES - KEY LESSONS LEARNED

Since implementation of the SAC Scheme in 1997, a number of emerging issues have surfaced in the use and administration of the SAC funds. Useful lessons have been also been learned. From the benefit of experience gained by DAL, commodity bodies and the Bank, necessary reforms must be implemented by all stakeholders, to ensure we are all working towards the self sustainability of the SAC Scheme revolving fund. Some of the key emerging issues and lessons are discussed here.

Demand for SAC Loans

The fast depletion of the seed capital, within the three years shows the popularity and demand for the SAC loans by the smallholder farmers. The initial seed capital of K10 million is insignificant to meet demand. The nature of cash crops which require grace periods of up to three years before loan repayments can flow back into the revolving fund, does not assist the liquidity of the revolving fund account. To date there are up to K5 million of loaned funds, which are not due for repayment yet; hence seed capital is tied up and not revolved, to sustain continuous lending.

The initial seed capital of K10 million is seriously insufficient to secure the sustainability of the revolving fund.

Arrears Trend

A disturbing trend is the level of arrears, which is greater than the acceptable level of around 10 percent. Livestock, cocoa and food crops are sub sectors of concern. Table 6 provides a summary of the status of the arrears owed by commodity type.

The level of arrears for each commodity is directly related to the efforts of the commodity bodies, in terms of both the focus and ownership at all levels of the organization including top management, and the structure, processes and the resources provided by these commodity bodies, to ensure there is repaymet of loans.

Lending Outside Commodities Bodies

Livestock (28%) and food crops (22%) have high arrears reflecting the not too well coordinated extension system.

Table 6. **Status of arrears owed by various commodities.**

Commodity	Loan Balances outstanding	Areas @ 30/6/2000	%
Coffee	K2,041,875	K 173,000	8
Cocoa	K1,808,567	K 575,752	26
Oil Palm	K 757,337	K 33,072	2
Coconuts	K1,067,986	K 315,806	14
Livestock	K 878,002	K 609,753	28
Food Crops	K 820,712	K 485,072	22
Spices	K 106,221	K 15,894	1
Rubber	K 1,164		
Total	K7,481,865	K2,208,448	100

There is no accountability for those loans that are recommended by DAL staff. The Bank has experienced great difficulty in recovery, because of the high turnover of DAL staff (no continuity). DAL does not have the extension resources and the resources and expertise in credit management.

The arrears from lending to smallholders using commodities bodies have shown superior loan repayment performance in nearly all cases.

The Bank has learned that lending must be tied to commodity bodies with the resources, management commitment, processes and expertise to ensure there is security of loan repayment.

Best Practice

In three years the Coffee Industry Corporation, has clearly established itself as the most effective and efficient commodity body in the total SAC Scheme management and delivery. The basis of the Bank assessment is both qualitative and quantitative. On the basis of the quantitative measures like the level of arrears and the production of quarterly physical reports, CIC is superior.

The Oil Palm Industry Corporation despite severe resource constraints has developed very harmonious working relationships with the milling companies, and farmers. The milling companies, which are monopolies, make loan repayments directly to the Bank, hence in credit performance to date (1% arrears) there is relatively little risk in lending SAC seed capital to farmers in the oil palm industry, other than future drop in export prices.

Distribution of SAC Loan by Provinces

Since the inception of the SAC Scheme, loans under this scheme has been distributed to 18 provinces in PNG except Western Province. Lending has not occurred in Western Province because there is no Extension arrangement in place to facilitate lending in that Province.

There is such a wide spread dispension of penetration of leanding to various commodities and the flow on benefits to various Provinces, depending on the spread of commodity bodies presence in respective Provinces, the up take by the various Provinces and the physical presence of Bank operations in Provinces.

RECOMMENDATIONS

After three years of valuable experience in managing the revolving fund, the following recommendations are made to strengthen and improve the financial performance of the SAC Scheme. These recommendations are consistent with our objective of achieving self - sustainability of the scheme, in the medium term.

POLICY RECOMMENDATIONS

Role of DAL

All future lending under the SAC Scheme are to be provided in partnership with commodity bodies and the Bank. No loan funds should be provided with DAL as the extension body. DAL function to be restricted to the lead agency roles of policy formulation and implementation, com-

Table 7. Loan approvals to various sectors in each Province as at 31 December 1999

Loan Type	20/- Coffee		21/- Cocoa		22/- Oil Palm		23/- Coconut		24/- Livestock		25/- Food crops		26/- Spices		27/-Rubber		Total Approvals	
Province	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans	No. of Loans	Value of Loans
Central	15	38,122	-	-	-	-	2	2,330	8	68,230	5	34,370	2	18,581	-	-	32	161,63
Milne Bay	4	5,223	1	4,990	120	478,049	30	88,905	18	42,705	1	920	-	-	-	-	174	620,79
Oro	5	18,126	46	152,106	9	58,055	3	2,400	9	32,704	-	-	-	-	-	-	72	263.39
Gulf	5	10,842	-	-	-	-	3	6,910	12	49,171	-	-	2	10,621	-	-	22	77,544
Western P.																	-	-
W.H.P.	66	319,003	-	-	-	-	-	-	276	603,109	66	329,285	1	2,692	-	-	409	1,254,28
E.H.P.	228	637,647	-	-	-	-	-	-	21	33,103	83	278,658	3	5,189	-	-	335	954,59
Enga	91	133,350	-	-	-	-	-	-	6	25,642	5	34,000	-	-	-	-	102	192,99
Simbu	134	342,863	-	-	-	-	-	-	89	276,636	20	62,044	8	35,500	-	-	251	717,04
S.H.P.	69	138,028	-	-	-	-	-	-	48	167,401	33	177,769	-	-	-	-	150	483,19
Morobe	35	65,612	31	118,500	-	-	34	66,350	-	-	-	-	-	-	-	-	100	270,46
Madang	37	58,741	129	484,924	-	-	119	434,317	-	-	-	-	1	10,000	-	-	283	987,98
E.S.P.	70	98,860	40	145,533	-	-	22	63,853	-	-	-	-	-	-	-	-	132	308,24
E.N.B.	-	-	284	1,049,960	-	-	80	234,527	-	-	-	-	3	19,500	-	-	367	1,303,98
W.N.B.	-	-	15	59,695	251	1,144,291	57	247,659	26	47,390	-	-	-	-	-	-	349	1,499,03
New Ireland	-	-	44	100,631	1	3,373	102	269,740	8	17,781	-	-	-	-	1	4,139	156	395,66
Bougainville	-	-	31	110,319	-	-	3	7,729	3	17,358	-	-	-	-	-	-	37	135,40
Manus			43	70,000			5	10,607									48	80,60
Sandaun			20	75,594			3	9,000									23	84,59
Total	**759**	**1,866,417**	**631**	**2,372,252**	**391**	**1,683,768**	**453**	**1,464,327**	**524**	**1,381,230**	**213**	**917,046**	**20**	**102,283**	**1**	**4,139**	**3,042**	**9,791,46**

pliance auditing, coordination, impact assessment and stakeholder management roles especially the Government through the Ministry of Agriculture and Livestock.

Criteria for Seed Fund Allocation

Future loans from additional seed capital should be allocated on the basis of the repayment, actual arrears performance and compliance with other obligations under the MOA signed between the Bank and the various commodity bodies.

Use of Best Practice

All commodity bodies are to adopt the CIC model for the management and implementation of the SAC Scheme, as a requirement to secure additional seed capital for future lending. DAL to ensure compliance by commodity bodies and where necessary assist with PIP or other assistance, to secure compliance.

Equitable Distribution of Accessible Credit

In order to get more smallholder farmers to participate in the SAC Scheme and thereby spread the benefit of cheap accessible credit to a greater proportion of our rural population, a policy for farmers to benefit from SAC loans only once is required.

Those who are successful in paying their loans should graduate to the normal agriculture loan of the Rural Development Bank, where interest is not subsidized like the current SAC loans. These customers will be treated as priority customers of the Rural Bank under the Bank's priority customer lending strategy.

A policy on gender composition is recommended in order to encourage and support more women farmers to access the SAC loans.

Recommendation for Additional Seed Capital

DAL and Rural Development Bank to jointly submit an NEC information paper on the status of the SAC Scheme since implementation in 1997.

The paper to include a submission for an additional K20 - K30 million seed capital in the 2001 budget, to allow the Rural Bank to continue lending under the SAC Scheme.

Recommendation for Exclusive SAC Funds for Women

DAL, the National Council of Women and the Bank should collaborate to seek seed capital to supplement National Government seed capital for exclusive lending to women under the SAC Scheme, using the theme of gender equality as the catalyst in marketing the concept to potential donors.

POLICY AND STRATEGY

Miri Setae[1], MBE.

PLANNING FOR NATIONAL ECONOMIC GROWTH THROUGH AGRICULTURE

Policy and planning, which encourages robust growth in the agriculture sector will improve the welfare of the majority of the people. It provides economic growth and improved living standards.

Traditional systems do not provide a higher living standard. Further, by international standards, there is a growing level of poverty in PNG. Population pressures are also placing considerable strain on our traditional system and people are vulnerable to poverty.

Government's principal role in economic development is to create the appropriate environment that will enable people to mobilise their own resources to achieve increasing living standards.

There should be stronger and more diversified food and livestock sector. Also there should be opprotunity to use agricultural skills as the means of entry into cash economy.

Medium Term Development Strategy (MTDS) is expected to create this environment, which focuses on basic education, health care, infrastructure, law and order and on increasing the opportunities for the private sector.

There is a clear need to revitalise agricultural research and extension and strengthen farmer-training programs.

As we enter the new millennium, the agricultural sector will remain as the principal focus of our planning policies.

Recommendations

1. Revitalise agricultural research and exension and promote development of agricultural business through improved marketing, processing and export.

2. Identify and devise ways and means to infuse technology into subsistence agriculture. It is strongly recommended that the proluction base be diversified to basically improve food security and nutrition of the peoplewhere applicable.

3. Every effort should be made to makenvestment in grain and livestock sector togreatly enhance overall food security and cit down on high import bills. Speciall attentior needs to be directed toward stock feed proluction as no fewer than four mills already exist in the country and they are at present supplied with raw materials from overseas.

AGRICULTURE TRADE

Trade provides market outlet for goods and services. In 1998 agriculture trade value wa: K1.02 billion with the market share of 27.5%in total export. Agriculture sector is one of the sectors where PNG has comparative advantage Traditional cash crops contributed 12% but declining; erratic economic growth, low productivity, high cost, protection, higher tariffs on inputsare the major contributing factors. Topography, debt, land tenure, poor infrastructure, poor support services and small markets are other factors.

There is growth potential in agricultur trade. Efficient mobilization of resources and cedit are required. In the recent past trade policy was outward looking or export oriented.

[1] Secretary, Department of Agriculture and Livestock, Port Moresby.

As a member of WTO and APEC, PNG has committed itself to reap the benefits of the multinational open trading system. For this purpose there is a need to improve market access, reduce domestic support and export subsidies.

There is also a need to satisfy quality and phytosanitary standards. Pacific Island countries are mobilizing and consolidating regional support and resources.

The Small and Medium Enterprise policy of 1998 calls for action to increase market access, human resource development, infrastructure, information and technology input.

This is complemented by the National Investment Policy, which promotes business environment for greater investment and business growth.

PNG should analyse market trends, needs, demands, challenges and opportunities and decisions of its market strategies, if benefits are to be realised.

Recommendation concentrate in areas where we have comparative advantage, reduce cost of production, improve quality and diversify the export base and the market.

TRANSPORT

The problem of road transport was highlighted as a major impediment in the production and marketing of agricultural produce. The problem starts from the farm gate to the market and continues on to the point of consumption.

In 1990 to 1999 funds made available for maintaining national roads were only 32% of the estimated requirements. The maintenance of both provincial and national roads too is facing a major funding problem.

Recommendation

That government should look at alternative modes of transport for agricultural, forestry, mining, livestock and passenger travel. For this purpose the government has no option but to consider rail road construction initially in areas where it is conducive to do so. Development of railroad system would generate considerable employment not only in initial construction but also in their running and maintenance.

AGRICULTURE AND THE BOUGAINVILLE PEACE PROCESS

Agriculture is the main source of food and cash income in Bougainville. Before 1989, Bougainville was the largest cocoa-producing province in the country and had some of the largest commercial coconut plantation and was also a major copra producer.

Village based cocoa and copra production was additional to subsistance agriculture, vegetable, fruits and meat which were also sold. As the crisis spread and intensified agriculture production declined and exports ceased. An entire generation of young people have since grown up with no agricultural experience or formal education. This affected food security.

But as peace process initiated since late 1997 the trend has been reversed and cocoa and copra production is increasing. Cocoa fermentaries and copra driers are being repaired. Village based agriculture is gradually recovering. New crops are introduced. More needs to be done to reach the pre-conflict status of agriculture. Agriculture is therefore, integral to restoration and development in Bougainville.

Agriculture redevelopment requires active participation by business and the community and requires wider consultation and support. The dialogue to buy back privately owned plantations and their distribution to traditional landowners should be pursued.

The cocoa and coconut extension agency is rehabilitating and planting more than 9 million cocoa and 100,000 coconut trees.

European Union, AusAid and UNDP are providing funding support to promote agriculture development, infrastructural needs, education, and access to finance.

Recommendation

That the above effort be vigorously pursued. In addition to cash crops the food crop sector should also be revitalised by bringing improved varieties of seed and planting materials.

AGRICULTURAL INCENTIVES

SUSTAINABLE CREDIT

The point was made that the attainment of any form of sustainable agriculture credit will depend on the macro-economic and political stability in the country. Such a situation might be conducive in bringing interest rates down, and encourage credit facilities to play a major role in rural development.

While the setting up of a farmer's bank was proposed, there were also concerns that the inability of the farmers to manage business profitably made rural lending schemes wary of lending to farmers. The privatization of rural development bank as a private profit making company was welcomed.

Recommendation

That good training was required to create awareness amongst farmers about their responsibilities as borrowers. DAL should make submission for 20-30 million Kina to boost SACS seed money.

MARKETING, AGRO-INDUSTRY AND QUALITY

Marketing of food products must initially target the local markets where there are business opportunities. Transportation of agricultural products, especially food items, faces many problems. And this results in produce not reaching the markets on time and in a satisfactory state leading to heavy losses. Therefore, the need for improving transportation and market access for food crops cannot be over emphasized.

There are ample opportunities for down-stream processing of many agricultural commodities produced locally. These must be investigated and strategies and action plans needs to be formulated and implemented.

There are concerns on the possible impact of Genetically Modified Organisms and Food on local Agriculture, environment and human health under the current trade agreements.

Recommendations

a. Research

The agricultural policies need to be designed to revitalize and enhance research, extension and development, increase food production to attain food security and reduce dependence on imports.

While it is essential that a well planned and well supported agricultural research has been and shall continue to be required for the optimum development of agriculture sector in PNG, this activity must cater for the needs of food crops, fruits, vegetables and livestock. It was recognized that considerable amounts of exotic fruit species exist in agricultural research stations in PNG. And that they should be utilized to promote fruit industry development.

b. Extension

It was recognized that the agricultural extension system in PNG has collapsed, although commodity extension schemes are functioning well for tree crops. Therefore highest priority be accorded to establish a national collaborative extension and network develop-

ment scheme coordinated by DAL, involving all sectors of agricultural industry.

c. Training

Training and introduction of appropriate technology should be promoted. Training and support for women in food production and processing is fully supported.

d. Information

The importance of authoritative information in all activities of the agriculture enterprise was recognized. It was appreciated that there was the need to fund and staff the DAL's Printing and Publication Unit and bring out its publications regularly. The need for DAL to provide up to date statistical information on agricultural production, imports and exports of all commodities was also emphasized. The use of transistor radios and mobile phones hooked to an agriculture channel also needed to be explored.

e. Marketing

The need to develop infrastructure such as feeder roads, nantional roads and marketing facilities was recognized. In addition it was observed that facilitation to transport and infrastructure of perishable produce need to be put in place and required urgent attention.

f. Down-Stream Processing

In doing down-stream processing it was necessary to focus on domestic market because at this point in time it is difficult to compete with overseas products. The scope for such down-stream processing of tree crops, root crops, grain crops, vegetables, fruits & nuts need to be exploited fully.

g. Biotechnology

PNG is a member of WTO & APEC, ratified GATT and CBD and will ratify an International Biosafety Protocol. Concerns in relation to the impact of Genetically Modified Organism (GMOs) and food (GMF) on agriculture, the environment, and human health have been expressed. A National Biosafety Guidelines and National Biosafety Committee need to be set up to deal with imports causing biosafety concerns. This should protect public and national interest and foster a better position for PNG in the world markets.

To prevent unsafe imports and protect National Agriculture Development, there is need to pay attention to non-tariff barriers to trade, such as biosafety and quarantine measures and food standard requirements.

h. Quality Control

Continued government support is recommended for NAQIA to exercise quality control on exports and imports and to prevent introduction of pests, diseases and weeds.

TREE CROP INDUSTRIES

Major tree crop industries (Oil Palm, Coconut, Coffee and Cocoa) face similar constraints to increase production and profits although the extent of the problems varies with individual industry.

Extension and research undertaken by the different industries to improve productivity and quality have produced a positive impact on the performance of the respective industries. All commodity Boards are committed to improve and maintain these services to the producers.

Major problems are poor road condition, land disputes and the associated social issues.

Current local rubber production is not adequate to supply the needs of the existing factories in PNG. Further development of this industry is expected to generate employment and export revenues of up to US$60 million per annum.

Despite the existence of vast potantial for spice development in the country the industry has not

been able to progress due to a range of issues, which require attention at all levels.

General Recommendations

1. Road maintenance and transport facilities are a major limiting factor. As recommended earlier, the development of railroad transport system should be given top priority.

2. All the above industries require financial support to strengthen their extension services as recommended earlier.

3. The need for greater research activity was recognized. It is recommended that consideration should be given to strengthening young scientist cadet scheme with a view to direct national scientists into agricultural research.

Specific Recommendations

Cocoa

That governments at National, Provincial and Local leve's provide support, funds and other resources to.

a) acquire and redistribute run down cocoa plantations
b) extend seed capital for a credit scheme
c) assist with the Board's quality improvement programme
d) assist with the Board's downstream processing programme.

Coconut

That the Board:

1. Improve its corporate functions, its efficiency and accountability;

2. Strengthen coconut research and development in PNG;

3. Promote coconut downstream processing, and coconut product and by-product utilisation;

4. Promote participation of growers and producers in industry affairs; and

5. Seek and secure government budgetary support for a national coconut rehabilitation and redevelopment programme in 2001.

Rubber

Government should provide funding to rehabilitate and expand rubber industry in the existing as well as new areas of PNG. Funding should also be provided for the retooling of the rubber factories at Gavien and Cape Rodney Rubber Schemes.

Spices

1. The existing policy directives on spices and essential oils be recognised with the view to fully developing a viable spice industry.

2. The Spice Industry Development Plan and develop programmes and projects to be endorsed and implemented.

3. The Spice Industry Board's development budget for its full establishment and operation for the 2001 financial year be funded.

4. The NDAL's PIP of Alternative Crops Expansion and Diversification Programme be resurrected and funded to become the SIB's extension programme.

LIVESTOCK INDUSTRY

In recent years cattle industry showed a decline due to many problems, which should be addressed by all concerned. Remove excessive import tariffs and give same concessional advantage to all sectors. Supplementary paddock feeding using PNG produced agricultural by-products will be adopted to improve cattle production. Although beef is cheaper than chicken, this does not reflect in sales. There is a need to have strict quarantine system to maintain the animal health status in PNG. Develop appropri-

ate technologies in pasture improvement, stock management and supplementary feeding for small farmers and provide skills and business training.

Recommendations

1. Recognise the development of the supplementary paddock feeding system and encourage the utilization of PNG produced agro-industrial by -products (copra meal, oil palm kernel cake and molasses) to supplement pasture to finish and improve carcass quality and hence profitability.

2. That DAL, NAQIA, NARI and LDC collaborate with the industry and other stakeholders to improve the marketing of domestic beef through aggressive advertising and product merchandising.

3. That NDAL, PDAL and NAQIA prepare annual budgets to control disease and pest outbreak and maintain strong quarantine protocols.

4. The industry seeks a facilitative and supportive role from NDAL and other government agencies for research, technology development, skills development and business training.

5. That NDAL develops strategies to increase domestic meat production to reduce dependence on lamb flaps and other cheap imports.

6. That NDAL prepare a NEC submission to reduce the tariff on agricultural inputs.

AGRICULTURE POLICY AND STRATEGIES

Honourable Mao Zeming[1], MP.

Provincial Agriculture Chairmen, Chairmen of Industry Corporations, Head of Provincial Administration, Agriculture Advisors, Ladies and Gentlemen.

The last two-day's discussions have highlighted various issues that are facing agriculture sector development in PNG.

The purpose of this conference is to identify the issues and constraints and formulate policies and strategies to overcome them for implementation.

A major concern that has been highlighted throughout the two days presentations is inadequate funding for the agriculture sector as a whole. Here I must plead guilty and submit that things have not been well with the national government accounts and it is only now that we are on a somewhat solid grounding. But this also, as the Prime Minister indicated sometimes ago, can change for bad or worse with one single wrong move.

Extension has been singled out as a major component needing funding and re-organization. Here the government would seriously consider the recommendations arising out of this conference.

Another major bottleneck faced by all sections of agriculture sector is the crumbling road transport. I am glad that this conference has recommended the possibility of putting a railroad system in place, which would transport agriculture produce, forestry products, livestock and passengers. We would consider this recommendation seriously.

The FAO recommendations on coffee industry have caused serious concern among the growers. Let me assure everyone here that NEC would take a decision in this matter only when various views have been debated exhaustively.

Agricultural Research has been highlighted as an important area of attention by this conference. The Morauta Government is seriously committed to research and training of national research scientists. It is time to seriously implement trainee scientist cadetship schemes, one already operational in NARI so that innovation can flourish in PNG.

Effective and efficient farmer training programme needs to be implemented to upgrade the farmer's skills, to undertake agriculture as a commercial enterprise.

I have directed DAL and the Commodity Boards to give greater attention to this aspect. This will make our farmers to face the changing world with confidence.

Revitalization of the agriculture information system at all levels to be urgently addressed. The government would encourage this and provide adequate funding to ensure this is implemented as soon as possible. This area cannot be neglected any longer.

As PNG is a member of the WTO and APEC, it is imperative that our agricultural exports need to be of high quality to reap maximum benefits under the trade agreements. To this end every effort would be made to achieve this goal. And farmers should be trained and facilitated.

Further, the government will ratify an international Biosafety Protocol in relation to the import of Genetically Modified Organisms (GMOs) and

[1] Deputy Prime Minister and Minister of Agriculture and Livestock, Papua New Guinea.

food (GMF) and on agriculture, the environment, and human health.

A National Biosafety Guidelines and National Biosafety Committee need to be established to deal with imports causing biosafety concerns. This should protect public and national interest and foster a better position for PNG in the world trade market.

Down-stream processing of agricultural products is another area that requires urgent attention. This will add value to the products, and provide not only additional income to our farmers but also create employment opportunities in the rural sector.

Agriculture development in Bougainville is a priority. The government with the help of the donor agencies would implement a range of agricultural development programmes to provide food and cash that is urgently required to revive the economy of this province. This would certainly enhance the peace process.

The two day Conference has been a success. I would like to see recommendations arising from this conference to be submitted to the Government, which hopefully, should form the basis for Year 2001 budget for the agriculture sector.

Ladies and gentlemen, thank you for your contributions.

For those conference participants who are returning to their respective provinces, I wish you a safe journey back.

I now declare the Policy and Strategy conference closed.

CHIEF ADVISER AND CO-ORDINATOR

Mr Philip Pondikou, First Assistant Secretary, Corporate Services

ORGANISING COMMITTEE

Mr. Mathew - wela B. Kanua, FAS, Technical Services (Chairman)
Mr. Stephen Mesa, Director, Northern Region (Member)
Mr. Sam Rangai, Director, National Agriculture Council (Member)
Ms. Jackie Tupia, Liaison Officer (Member)

CONFERENCE PROGRAMME

DAY 1 - MONDAY, 7TH AUGUST, 2000

SESSION ONE

OFFICIAL OPENING

Master of Ceremony: Mr. Bami Sorokine
- Morobe Provincial Administration, Lae

07.00-7.30 am	Arrival of Singsing Groups, School Children Arrival of VIPs, Conference Delegates, and Guests at the Morobe PHQ and are seated
08.00 am	Prime Minister's Vehicle arrives at 4th Street and is led by Singsing Group.
08.30 am	Prime Minister Arrives at Morobe PHQ is received by Commanding Officer Lt Col. J. Fabila
08.45 am	Guard of Honour - PNGDF Engineer Battalion, Igam Barracks. Flag Raising - Huonville Primary School Student(s) National Anthem - Sipia Brass Band, Huonville School & Audience National Pledge - Huonville Primary School & Audience
09.00 am	Dedication of the 17th NAC & National Food Security Policy. - His Lordship, Rev. Dr. Wesley Kigasung, Head Bishop Evangelical Lutheran Church of Papua New Guinea Hymn - Sipia Brass Band.
09.15 am	Welcome Address - Governor for Morobe. Hon. *So-ngang* Luther Wenge. LLB MP. Official Address and Declaration of the opening of the Conference - Prime Minister of Papua New Guinea, The Rt. Hon. Sir Mekere Morauta. Kt., MP.

LAUNCHING OF THE NATIONAL FOOD SECURITY AND SWEARING IN OF THE MINISTERIAL COMMITTEE.

Master of Ceremony: Mr. Miri Setae, MBE, Secretary, Department of Agriculture and Livestock
Rapporteurs Mr. Vele Kagena and Mr. Anton Benjamin

09.30 am	Launching of the National Food Security Policy - Prime Minister, The Rt. Hon. Sir Mekere Morauta, Kt., MP Swearing in of Committee Members

PRESENTATION OF GIFTS

10.00 am	Recipient: The Prime Minister and Ministerial Committee From: Morobe Province Gavman for and on behalf of the

People of Morobe
10.00-10.30 am Morning Tea - International Hotel

FOOD DISPLAY: NIALL COMMUNITY HALL - DAL Morobe/Industry/Farmers

10.30 am Prime Minister, Food Security Committee & Morobe Governor (excluding other Conference participants)

SESSION TWO

POLICY AND STRATEGY

Chairman: Mr. Miri Setae MBE, Secretary, Department of Agriculture and Livestock
Repporteurs: Mr. P. Pondikou and Mr Ereman Ragi

10.30-10.50am Planning for National Economic Growth through Agriculture
- Honourable Moi Avei, MP, Minister for Planning and Implementation

AGRICULTURE INCENTIVES

10.50-11.10am Agriculture Trade
- Honourable Michael Nali, MP, Minister for Trade and Industry
11.10-11.30am Transport - Key to Agriculture Development
- Honourable Bart Philemon, MP, Minister for Transport and Civil Aviation
11.30-11.50am Agriculture Rehabilitatioin for Bougainville
- Rt. Honourable Sir Michael Somare, GCMG, MP, Minister for Mining and Bougainville Affairs
11.50-12.10am Discussions and Summaries
12.10-1.20pm Lunch
1.20-1.40pm Sustainable Agriculture Credit
- Dr. Beno Boeha, Director, National Research Institute
1.40-2.10pm Discussions and Summaries

SESSION THREE

RESEARCH AND EXTENSION

Chairman: Mr. Bill Lawrence, Chairman, LDC
Rapporteurs: Mr. G. Mosusu and Mr. A. Benjamin

2.10-2.30pm Agriculture Policies - DAL Perspective
- Mr. Kino Wenge, FAS, Policy and Planning Coordination
2.30-2.50pm Focus for National Agriculture Research in PNG
- Sir Alkan Tololo, KBE, Chairman, NARI

2.50-3.10pm	New Agriculture Extension System - Dr. Sam Lahis, Director, SSSPP
3.10-3.30pm	Importance of Agriculture Information - Professor Ray Kumar, UPNG
3.30-4.00pm	Discussions and Summaries
4.00-4.20pm	Afternoon Tea

SESSION FOUR

MARKETING, AGRO-INDUSTRY AND QUALITY CONTROL

Chairman: Dr. Beno Boeha, National Research Institute
Rapporteur: Mr. G. Gorogo

4.20-4.40pm	Agriculture Marketing - Mr. Phil Franklin, President of Chairman of Commerce
4.40-5.00pm	Downstream Processing of Agriculture Products - Mr. Wayne Golding, Pres. of Cham. of Manufacturers Council
5.00-5.20pm	Biotech/Biosafety Guidelines - Dr. Mohammed Waghi, PNG University of Technology
5.20-6.00pm	Discussions and Summaries
7.00pm	Welcome Dinner - Lae International Hotel - Hosted by Hon. Mao Zeming, MP, Deputy Prime Minister and Minister for Agriculture and Livestock

DAY 2 - TUESDAY 8TH AUGUST

INDUSTRY PAPERS - SESSION 1

TREE CROP INDUSTRIES

Chairman: Mr. Sam Tulo, OBE
Rapporteurs: Mr. Felix Bakani and Mr. Uron Safum

8.00-8.05am	Opening Prayer - Pastor Pina, CLC, Lae
8.05-8.25am	Prospects for Palm Oil - Mr. Yawal Mazewin, Chairman, OPIC
8.25-8.45am	Prospects for Coffee Industries - Mr. Pugma Kopi, Chairman, CIC
8.45-9.05am	Prospects for Coconut Industries - Mr. Robinson Namaliu, Chairman, CMB
9.05-9.25am	Prospects for Rubber Industries - Mr. Rahman Galrich
9.25-10.00am	Discussions and Summaries
10.00-10.30am	Morning Tea

SESSION TWO

TREE CROP (CONTINUES), SPICES AND LIVESTOCK

Chairman: Mr. Bob Hargreaves
Rapporteur: Mr. William Gwaiseuk

10.30-10.50am	Prospects for Cocoa Industries - Mr. Sam Tulo, OBE
10.50-11.10am	Prospects for Spices Industries - Mr. M. Waisime, Executive Officer, SIB
11.10-11.30am	Prospects for Livestock Industries - Mr. Gonny Bubar, President, Cattlemen's Association
11.30-12.00pm	Discussions and Summaries
12.00-1.00pm	Lunch

SESSION THREE

FOOD INDUSTRIES

Chairman: Professor Ray Kumar
Rapporteur: Mr. Kino Wenge

1.00-1.20pm	Prospects for Fresh Produce Industries - Mr Bab Hargreaves, Chairman, PPDC
1.20-1.40pm	Quality Control - Mr. Daniel Takendu, Chairman, NAQIA
1.40-2.00pm	Discussions
2.00-5.00pm	Break for Secretariat to summarise conference proceeding

SESSION FOUR

Chairman: Mr. Valentine Kambori
Rapporteurs: Professor Ray Kumar & Mr. Siva Supiramaniam

5.00-5.30pm	Summaries and Recommendations - Mr. Miri Setae, MBE, Secretary, DAL Wrap up of Day 1 & 2 - Honourable Mao Zeming, MP, Deputy Prime Minister & Minister for Agriculture and Livestock

CLOSING OF POLICY AND STRATEGY CONFERENCE

PARTICIPANTS TO THE CONSULTATIVE CONFERENCE

Reforming and Restructuring the Agriculture Sector at Local Level (7-11th August, 2000, Lae)

MINISTRY PARTICIPANTS

MINISTERS AND MEMBERS OF PARLIAMENT

1. Rt. Hon. Sir Mekere Morauta, Kt., MP., Prime Minister for PNG
2. Hon. Mao Zeming, MP., Deputy Prime Minister and Minister for Agriculture & Livestock
3. Rt. Hon. Sir Michael Somare, GCMG., MP., Minister for Mining and Bougainville Affairs
4. Hon. Bart Philemon, MP., Minister for Transport
5. Hon. Ron Ganarafo, MP., Minister for Fisheries
6. Hon. Michael Nali, MP., Minister for Trade & Industry
7. Hon. Herowa Agiwa, MP., Minister for Environment and Conservation
8. Hon. Luther Wenge, MP., Governor, Morobe Province
9. Hon. Tukape Masani, MP
10. Hon. Kenedy Wenge. MP

PRIME MINISTER'S DEPARTMENT

11. Mr. Paul Barker

DAL PARTICIPANTS

MINISTER'S OFFICE

12. Mr. Henry Yakham, Ministry of Agriculture and Livestock
13. Mr. Gia Boi, Ministry of Agriculture and Livestock
14. Mr. Sam Basil, Ministry of Agriculture and Livestock
15. Mr. Paul Kisa, Ministry of Agriculture and Livestock

TOP MANAGEMENT

16. Mr. Miri Setae, MBE, Secretary, Department of Agriculture & Livestock
17. Mr. Philip Pondikou, FAS, Corporate Services
18. Mr. Mathew Kanua, FAS, Technical Services
19. Mr. Kino Wenge, FAS, Policy Planning and Cordination Services
20. Mr. Andrew Yamanea, Director, Agriculture Education & Training
21. Mr. William Gwaiseuk, Director, Policy and Planning
22. Mr. Sam Lahis, Project Director, Smallholder Support Services Pilot Project
23. Mr. George Mosusu, Director,, Monitoring and Evaluation
24. Mr. Siva Supiramaniam, A/Director, Science and Technology

25. Mr. Anton Benjamin, Director, Food Security, DAL
26. Mr. Fred Dori, Director, PISS, Ireland Region
27. Mr. Steven Mesa, Director, PISS, Momase Region
28. Mr. Vele Kagena, Director, PISS, Southern Region
29. Mr. Ian Mopafi, Director, Highlands Region
30. Mr. Sam Rangai, Director, NEC
31. Ms. Jackie Tupia, Liaison Officer, NEC
32. Mr. Soldier Buruka, Public Relations Officer
33. Mrs Eare Maiauka, Secretary, FAS Policy Planning & Co-ordination
34. Mrs Pukari Lora, Secretary, FAS Corporate Services

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35. Ms Boio Toua, Executive Officer, Headquarters
36. Mr. Joachim Pitala, Food Security, Erap
37. Dr. Chris Dekuku, Food Security, Erap
38. Mr. James Duks, Food Security, Erap

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39. Mr. Joachim Solien, Chief Training Officer

POLICY AND PLANNING DIVISION

40. Mrs Margaret Vatnabar, Chief Policy Advisor
41. Mrs Cecilia Kagena, Gender Development Co-ordinator
42. Mr. Ben Mindiria,
43. Mr. Ian Mesibere, SACS Co-ordinator

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44. Mr. Masain Moat, Northern Region
45. Mr. Philip Senat, Northern Region
46. Mr. Sakai Keposing, Northern Region
47. Mr. Solopi Sensik, Northern Region
48. Mr. Nelson Bomo, Northern Region
49. Mr. Francis Daink, Regional
50. Mr. Miri Areori, Regional

PROVINCIAL DAL

51. Mr. Simon Pondrilei, Advisor, Manus Province
52. Mr. Bire Bino, Advisor, Eastern Highlands Province
53. Mr. Nephion Terapi, Eastern Highlands Province
54. Mr. Bubia Muhuju, Eastern Highlands Province
55. Mr. Henry Besu, Morobe Province
56. Mr. Beka Siki, Morobe Province
57. Mrs Margaret Titus, Morobe Province
58. Mrs S. Siki, Morobe Province
59. Mr. Paschal Feria, Advisor, Madang Province

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60. Mr. Brivin Taul

DEPARTMENT OF PLANNING AND MONITORING

61. Mrs Maryanna Ellingson

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62. Prof. Ray Kumar, Biology Department, Univ. of Papua New Guinea, N.C.D
63. Prof. Mohammed Waghi, PNG University of Technology, Lae.

NATIONAL RESEARCH INSTITUTE

64. Dr. Beno Boeha, Director

NATIONAL AGRICULTURE QUARANTINE INSPECTION AUTHORITY

65. Mr. Daniel Takendu, Chairman.
66. Mr. Steven Rambe
67. Dr. David Pexton

NATIONAL AGRICULTURE RESEARCH INSTITUTE

68. Sir Alkan Tololo, Chairman.
69. Mr. Valentine Kambori
70. Dr. R.D. Ghodake

INDUSTRY REPRESENTATIVES

71. Mr. Wayne Golding, President, Manufacturers Council.
72. Mr. Gonny Bubar, President Cattleman Association.
73. Mr. Tony Power, Sago Specialist
74. Mr. Uron Salum, CCEA.
75. Mr. Phil Franklin, PNG Chamber of Commerce and Industry

PNG COPRA MARKETING BOARD

76. Ms Matilda Pilakapio, Deputy Chairperson
77. Mr. Ted Sitapai, Technical Advisor, CMB
78. Mr. Robinson Namaliu, Chairman, CMB

OIL PALM INDUSTRY CORPORATION

79. Mr. Yawal Mazewin, Chairman, OPIC

80. Mr. Felix Bakani, Managing Director, OPIC

COCOA BOARD

81. Mr. Sam Tulo, Chairman, Cocoa Board.
82. Mr. Ereman Ragi, Chief Executive, Cocoa Board.

COCOA & COCONUT RESEARCH INSTITUTE

83. Mr. Leslie Salum, Chairman, CCRI
84. Mr. James Kaiulo, Director, CCRI

SPICE INDUSTRY

85. Mr. Michael Waisime, Spice Industry Board

RUBBER INDUSTRY

86. Mr. C.K. Rahman, Galley Reach Holdings

COFFEE INDUSTRY CORPORATION

87. Mr. Badira, Vari, Chief Executive, CIC, Goroka

FRESH PRODUCE INDUSTRIES

88. Mr. Bob Hargreaves, Chairman, FPDC
89. Mr. George Gorogo, Managing Director, FPDC

LIVESTOCK DEVELOPMENT CORPORATION

90. Mr. Bill Lawrence, Chairman

DEPARTMENT OF MOROBE

91. Mr. Tafamo Mionzing, Lord Mayor, Lae city
92 Mr. Ainea Sengero, Administrator, Morobe Province
93 Mr. Bami Sorokine, Master of Ceremony, Morobe Administration

PROVINCIAL ECONOMIC SERVICES

94. Hon. Koni Iguan, MPA, Chairman, ES, Morobe Province
95. Mr. Gioving Bilong, Advisor, Morobe Province
96. Hon. Leo Deon, MPA, Chairman, ES, East New Britain Province
97. Hon. Ismael Tramba, MPA, Chairman, ES, East Sepik Province
98. Hon. Francis Posanau, MPA, Chairman, ES, Manus Province
99. Hon. Alphonse Mape, MPA, Chairman, ES, West New Britain Province
100. Hon. Malo Kinaifa, MPA, Chairman, ES, Eastern Highlands Province
101. Hon. Danny Kunda, MPA, Chairman, ES, Simbu, Province
102. Hon. Anton Pip, MPA, Chairman, ES, Western Highlands Province

103. Hon. Naikon Ipe, MPA, Chairman, ES, Southern Highlands Province
104. Hon. George Midiboda, MPA, Chairman, ES, Milne Bay Province
105. Hon. Lario Lawe, MPA, Chairman, ES, Central Province
106. Hon. Michael Gaume, MPA, Chairman, ES, Oro Province
107. Hon. Bogacbo Gageya, MPA, Chairman, ES, Western Province
108. Hon. Edie Avosa, MPA, Chairman, ES, Gulf Province
109. Hon. Peter Bais, MPA, Chairman, ES, Madang Province

OTHERS

RURAL AGRICULTURE BANK

110. Mr. Richard Maru
111. Mr. Caspar Antari

NATIONAL WOMEN's COUNCIL

112. Mrs Susan Setae, President.

POLICE FORCE

113. Mr. Alfred Rieu, Assistant Police Commissioner - Northern Command
114. Mr. Awan Sete, Metropolitan Commissioner (Members of Police Force)

DEFENCE FORCE

115. Lt. Col. J. Fabila, C.O. Igam Barracks, Lae, Morobe Provnce
116. Members of PNGDF, Guard of Honor, Igam Barracks, Lae, Morobe Province

SCHOOL REPRESENTATIVE

117. Representatives of Huonville Community School - Flag Raising

BAND REPRESENTATIVE

118. Sipaia Brass Band, (National Anthem), Morobe Province

RELIGIOUS REPRESENTATIVE

119. Rev. Dr. Wesley Kigasung, Bishop, E.L.C.

INTERNATIONAL ORGANIZATIONS

AUSTRALIAN INTERNATIONAL DEVELOPMENT ASSISTANCE BUREAU

120. Mr. Bernard Maladina, AUSAID (ACIAR)
121. Ms Maryanne McDonald

INSTRUCTIONS FOR CONTRIBUTORS

Papers must usually contribute to the advancement of knowledge in the discipline(s) concerned but short papers discussing techniques or published results, notes, bibliographies, book reviews and invited reviews of current knowledge in selected areas of interest to the journal would also be considered for publication. Articles offered for publication elsewhere or published previously will not be considered. All material submitted for publication will be refereed, reviewed and edited to meet the standards of the journal.

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2. **Title** - The title should be as brief as possible but should clearly indicate the content. It is not necessary to start the line with "A ... or" The ... or other non-significant words.

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5. **Key words** - A short list of key words should be provided for rapid scanning of the contents of the paper and use by abstracting agencies/ journals.

6. **Headings** - In experimental papers the general order of headings is: Abstract, Introduction, Materials and Methods, Results, Discussion, Acknowledgements, References, Appendix. In descriptive, or other types of papers, as far as possible a similar format should be followed. No headings should be underlined.

7. **Text** - Papers should be concise. Extensive introductions referring to the work of earlier authors should be avoided. Lengthy discussions and detailed descriptions should be reduced by the use of tables and diagrams. The text should not repeat in detail what is apparent from a table or diagram.

Names of countries or organisations may be abbreviated to capitals without full stops but must be given in full at the first mention.

Numbers under 11 should be spelt out unless qualifying a unit of measurement. If a number over 10 and anumber under 11 appear in the same sentence, both are written as numerals. Do not begin a sentence with a numeral. Factions should be given as decimals or spelt out. All decimal numbers less than unity should have a zero before the decimal marker, e.g. 0.25. All units should be in the S.I. system.

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Common or local names may be used but the scientific name should be quoted on the first occasion. An agricultural chemical must be referred to by its generic or common name when it is first quoted.

8. **Tables** - Numerical results should be displayed as means with relevant standard errors rather than as detailed data. Standard errors should be given to one place of decimals more than the means to which they refer and the number of degrees of freedom shold also be quoted. Tables should be complete in themselves so that they can be understood without reference to accompanying text. Each table should have a brief and self explanatory title. The presentation of the same date in tubular and graphic form is not permitted.

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BOWET, C.M. and SMITH, L.N. (1950). Measurement of phosphorus. *Methods of Soil Analysis*. Ed. C.A. Lack. Department of Primary Industry, Port Moresby. 400 pp.

SANDERS, A.J. (1940) Plant responses to molybdenum. *Papua New Guinea Agricultural Journal*. 48(4): 981-995.

TROBEN, M.M. (1973). Genetic fine structure in *Drosophila*. *Department of Primary Industry Research Bulletin* No. 102, pp. 196-197.

VANCE, P.N. (1976). Maize in the Markham Valley. pp. 215-220. *In: 1975 Papua New Guinea Food Crops Conference Proceedings*. K. Wilson and R.M. Bourke (Eds.). Department of Primary Industry, Port Moresby.

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