



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

AGRICULTURE IN THE DEVELOPMENT OF PAPUA AND NEW GUINEA

M. L. PARKER*

Primary production including subsistence production, accounts for about 60 per cent of the national income of Papua and New Guinea. The bulk of the indigenous people are subsistence farmers, or have contact with the cash economy through agriculture, and the agricultural industries provide virtually the sole source of export earnings. The position is nevertheless changing rapidly.

In 1969-70, agricultural exports from Papua and New Guinea, including processed coconut, passionfruit and pyrethrum, accounted for about \$62 million or 87 per cent of all exports of Territory origin, totalling \$71 million. By 1972-73 the value of exports will have increased four-fold to about \$230 million, of which the agricultural industries are not likely to contribute more than \$75 million or 33 per cent. On present indications, the export contribution of the agricultural industries could fall even further, to about 20 per cent in 1980.

This rapid change is partly a reflection of the growth expected in log, timber and woodchip exports, from \$6 million in 1969-70 to at least \$12 million per annum. Of far greater magnitude, however, will be the effect on exports of the major copper deposit on Bougainville. This mine will commence operation in 1972 with an initial annual output of at least \$140 million and there are prospects for the development of two further major mineral deposits on the mainland later in the decade.

Although under such circumstances they would no longer be the major source of export earnings, the agricultural industries will retain a predominant position in bringing the indigenous people into the cash economy and in providing avenues of both wage and self-employment. At the last census, in 1966, about 940,000 or 44 per cent of the indigenous population were still wholly engaged in subsistence activities and a further 790,000 or 37 per cent were involved in both the cash and subsistence economies in various degrees. It will be many years before there are employment outlets, outside the rural industries, for the greater number of these people. In these circumstances considerable importance attaches to steps being taken to develop the rural economy.

Agricultural Potential

With minor exceptions in some districts, the land resources exist for a substantial expansion in commercial production without impinging on subsistence needs. A recent assessment suggests that the area ideally suitable for agricultural use is of the order of 1.6 million acres, or 1.4 per cent of the total land area. The bulk of this land is on volcanic soils in East and West New Britain, Bougainville and the Northern district of the mainland. An area of somewhat lower potential, approaching 24 million acres, has a reasonable topography and is believed to be suitable for commercial agriculture, subject to various limitations. As shown in

* Office of the Economic Adviser, Department of the Administrator, T.P.N.G.

Table 1, sizeable additional areas are provisionally classified as suitable for mixed farming or grazing.

There are no reliable estimates of the area used by Papuans and New Guineans for commercial production, but it is believed to be of the order of 480,000 acres. The area under crop or pasture on non-indigenous holdings is recorded as 630,000 acres. The total area used commercially is therefore of the order of 1.1 million acres. There is consequently ample scope for an expansion of commercial production and it is probable that this expansion could occur under conditions favouring quite high yields.

TABLE 1

Land Use Assessment—Papua and New Guinea

Classification	Million Acres	Per Cent
Suitable for tree crops or arable agriculture	1.6	1.4
Agricultural topography but subject to various constraints (a)	23.9	20.7
Suitable for mixed farming	3.5	3.0
Suitable for grazing	4.7	4.1
Unsuitable for commercial agriculture (b)	63.3	54.9
Classification unknown	18.2	15.9
Total Land Area	115.2	100.0

(a) The selection of crops could be limited by altitude and the need for fertilizer. Localized physical constraints may be resolved economically by drainage or other means.

(b) Steep or swampy topography and extremely infertile soils. A large proportion of the subsistence gardens of the indigenous population is found within this category.

Source: Department of Agriculture, Stock and Fisheries, T.P.N.G.

There is very little data available to compare crop yields in developing countries, but a recent assessment by Charles¹ suggests that Territory plantation yields for coconut, cacao, coffee and tea are at least as high as those achieved elsewhere. Rubber is an exception as Malaysian yields are well above those of Papua and New Guinea. The Territory enjoys the considerable advantage that about three-quarters of the cacao is interplanted between coconuts, a practice which has been generally unsuccessful elsewhere. The success of interplanting in the Territory is attributed by Charles to the adequate rainfall and deep, well-drained and fertile soils of the New Guinea islands which are admirably suited to both crops.

Papua and New Guinea enjoys the further advantage that Territory production of raw coffee, copra, cocoa beans, rubber, tea, shell, pepper, passionfruit and peanuts is admitted to Australia duty free. In the case of coffee, the arrangement includes the remission of duty on raw coffee imported from sources other than Papua and New Guinea for each importer who during a specified period obtains 30 per cent or more of his requirements from the Territory. The marketing of Territory rubber is similarly facilitated by the remission of duty on rubber from other sources when the satisfactory sale of Territory rubber offering on the

¹ Charles, A. W. *Crop Yields and Planting Trends in the Territory of Papua and New Guinea*. Submission to the Rural Wage Enquiry. Port Moresby, 1970.

Australian market is assured. In addition, there is an arrangement between the Papuan Rubber Pool and Australian rubber manufacturers whereby prices are tied to the equivalent world price for No. 1 Sheet with the proviso that manufacturers pay an extra 0.25 cents per lb. for every cent per lb. that the world price is less than 25 cents. At world prices of 15 cents per lb. or less, the margin remains at 2.5 cents per lb.

At present, Papua and New Guinea enjoys Commonwealth preference on the British market for copra, coconut oil and coffee. With the entry of the United Kingdom to the European Economic Community, the Territory could expect to lose this preference and could face the common external tariff operating in member countries of the enlarged Community. This development could seriously affect the prospects for marketing the Territory's newer crops—tea and oil palm—if other producers are afforded concessions through their associate membership of the Community.

The Development Programme for Agriculture

It is now three years since the Five Year Development Programme² was endorsed as a basis for planning by the Territory House of Assembly and the Commonwealth Government. This programme calls for Administration expenditures totalling \$1,000 million over the five years to 1972-73. It sets guidelines for public and private investment in the agricultural, pastoral, timber, mining, manufacturing and service industries and outlines the scope and direction of proposed public expenditures in education, health, law and order and essential infrastructure—roads, ports, telecommunications and power.

Tree crops already account for 95 per cent of all commercial rural production and many of the development proposals centre about the planting and production of these crops. Special emphasis is given to tea and oil palm, but in view of the world market problems for coffee no expansion is planned for the latter crop.

The five year planting targets, shown in Table 2, were intended to lead to a 28 per cent increase in the area under coconut, cacao, rubber, tea and oil palm. Of the 278,000 acres of new plantings proposed during this period, the indigenous people were expected to be responsible for approximately 60 per cent. In addition, provision was made for increased indigenous production of pyrethrum, passionfruit, rice and other fresh foods, and it was proposed to extend the beef cattle herd to 138,000, including an indigenous herd of 31,000 head. By such means the proportion of rural production in indigenous hands was expected to rise to about 50 per cent by 1972-73 and the base would be established for greater increases in indigenous production in later years.

It was recognized that there was little incentive for further expatriate investment in new coconut, cocoa or rubber estates and it is Administration policy not to release additional land for the production of coffee by expatriates. Existing estates were expected to extend the area under crop and to maintain an adequate replanting programme but it was in the newer crops—tea and oil palm—and in cattle, that the bulk of the expatriate investment was expected, and has in fact occurred. Both tea and oil palm have been introduced on the basis of estate and small-

² Territory of Papua and New Guinea. *Programmes and Policies for the Economic Development of Papua and New Guinea*. Port Moresby, 1968.

TABLE 2

*Proposed New Plantings
1968-69 to 1972-73 (inclusive)
'000 Acres*

Crop	Indigenous		Total	Non-Indigenous	Total
	Settlement	Village			
Coconuts	8	100	108	50	158
Cacao	4	18	22	35	57
Rubber	8	11	19	5	24
Tea	3	4	7	12	19
Oil Palm	10	1	11	9	20
Total	33	134	167	111	278

holder production. Estate production is expected to provide an assured crop for profitable factory operations, but factories are expected to have sufficient capacity to process the additional crop grown by surrounding smallholders and villagers. In the case of cattle, the longer-term target is a national herd of 300,000 head. To achieve this, the immediate aim is to build up the breeding herd rapidly on existing expatriate holdings and additional grazing leases.

Subsistence production was not singled out for special attention. The indigenous people are generally well endowed with land on which gardening practices are closely interwoven with social and cultural patterns. Sweet potato provides the main staple but, depending on the locality, taro, yams, cassava, bananas, coconuts and peanuts may be extensively grown. Food gardens are often supplemented by foraging, hunting, fishing or the production of sago. The basic system of agriculture is one of bush fallow in which cultivation is regularly moved within a clearly defined area. For the most part, the subsistence needs of Papuans and New Guineans have been met without undue strain on available supplies of land and labour. In these circumstances, described by Fisk³ as 'primitive affluence', it has been possible to concentrate the efforts of the extension services upon commercial agriculture while dealing with problems of subsistence as they occur.

Tree crops planted during the period of the programme will not be in full production until well into the 1970's. The anticipated growth in value of output to 1976-77, at 6.6 per cent per annum is nevertheless consistent with the growth rates proposed elsewhere. The development plans of most developing countries call for an average annual increase in agricultural production of 4 per cent or more⁴. The highest growth rates appear to have been proposed for Costa Rica (7.1 per cent), Tanzania (7.5 per cent) and Surinam (7.7 per cent). Comparisons of this nature are limited, however, by marked differences in the scale and composition of the output, the variable statistical treatment of non-commercial production, and the extent of dependence upon export markets. Papua and New Guinea relies upon export markets for virtually all commercial

³ Fisk, E. K. 'Planning in a Primitive Economy: Special Problems of Papua and New Guinea'. *Economic Record*, 38: 462-478, Dec. 1962.

⁴ *United Nations Conference on Trade and Development*. TD/B/C. 3/58. Dec. 1968.

output and in the case of at least one crop—coffee—the increase in production that could be satisfactorily marketed falls considerably short of the Territory's immediate production potential.

Progress and Problems to Date

The information is available for only a preliminary assessment of progress made in the early years of the five year programme. New plantings appear to be ahead of the programme target for oil palm, but behind targets for coconut, cacao, rubber and tea. Overall, new plantings during the first two years are likely to fall short of the target by 30,000 acres, or 30 per cent⁵. On the other hand, there have been continued plantings of coffee—a crop for which there was no planned expansion. There has been a shortfall in the number of cattle slaughtered, but the growth in the national herd has been consistent with the programme. The output of tea and coffee has exceeded expectations, but shortfalls have occurred in copra, cocoa and rubber.

Seasonal conditions are not likely to have seriously affected plantings or production and the lower incidence of cocoa dieback might have been expected to encourage planting of that crop in the affected areas. With the exception of tea, prices received on world markets have been maintained at reasonable levels. In these circumstances, the shortfalls in production and plantings—particularly those of indigenous growers—are disappointing and serve notice of the many problems yet to be overcome.

At least 60 per cent of the shortfall in plantings has occurred on existing non-indigenous holdings. This is not unexpected as there has been a growing reluctance to invest in slow-growing tree crops and the incentive to do so is further limited while old stands continue to return a reasonable yield. The targets for indigenous growers, however, appeared to be capable of attainment, providing there was substantially increased involvement and effort on the part of the indigenous people. This proviso applied particularly to the bulk of the expansion which was to come from small-scale and scattered plantings in association with subsistence production. The problem is not only one of promoting new plantings, but of ensuring that Papuans and New Guineans maintain and make more productive use of existing plantings of cacao, coffee, rubber, coconut and pyrethrum.

The task of mobilizing the indigenous agriculture is largely one of changing the traditional society's values, attitudes and beliefs, within the limitations placed upon it by its own resources and those that can be effectively introduced. The scale of the task and the resources needed to bring about this change are often discounted. It is too early to assess whether the resources devoted to the task in Papua and New Guinea will be adequate, but it is at least possible to assess progress with some of the agents of change—the agricultural extension services, land tenure reform, transport and communications, and agricultural credit.

Agricultural Research and Extension

The direct costs of the Administration's effort in the field of agriculture, livestock and fisheries were assessed at \$65 million, or 6.5 per cent

⁵ Territory of Papua and New Guinea. *Programmes and Policies for the Economic Development of Papua and New Guinea—Review of Progress, 1969-70*, Port Moresby, 1970.

of planned Administration expenditure for the five years to 1972-73. Smaller outlays are channelled through other agencies, and a large part of capital works expenditure on transport and communications could also be expected to have a substantial bearing on the agricultural programme, as could outlays on community health, co-operatives, education, local government and other community services.

The capital and recurrent outlays on agricultural research, extension and marketing have been broadly in line with the development programme, but difficulties have been experienced in acquiring the skilled manpower required. The additional professional and sub-professional staff needed by the Department of Agriculture over the five years to 1972-73 was assessed as 280 officers. The Department has in fact been faced with a continuing shortage of experienced senior officers and this in turn has adversely affected the recruitment and utilization of lower level staff. An additional 36 overseas officers were appointed during the first two years of the programme out of a recruitment target of 66.

The dependence on overseas graduates is virtually complete at higher professional levels. The dearth of indigenous graduates will remain for many years to come although there are now proposals to introduce a course in agriculture at the University of Papua and New Guinea. However the sub-professional ranks are being filled to some extent by Papuans and New Guineans trained locally at Vudal Agricultural College. Thirty nine students completed the course during the first two years of the programme and it is expected that 135 will qualify over the five years to 1972-73. Additional overseas recruits are nevertheless needed even at the sub-professional levels and achievement of the programme targets will call for a considerable improvement in the number recruited and retained within the service.

Problems of Land and Land Tenure

Considerable shortfalls have occurred in the area of land purchased by the Administration for subsequent lease and development. Problems have arisen mainly through the growing reluctance of Papuans and New Guineans to make land available. Of the 206,000 acres of agricultural land proposed for purchase during the first two years of the programme, only 34,000 acres were acquired. Purchases of pastoral land were likewise well outside the programme target.

Shortages of land have not seriously affected progress to date, but could prove a major constraint on smallholder development in the future. Of the 167,000 acres of indigenous plantings proposed over the five year programme, 33,000 acres or 20 per cent are expected to come from smallholder settlement, divorced from the normal village environment. In fact, it appears likely that there could be a shortfall of the order of 30 per cent in the number of smallholder blocks available for release by 1972-73. The outcome will depend to some extent on the rate at which blocks can be established on 200,000 acres of Administration land held on the north coast of New Britain. For the most part this is land ideally suited to the production of coconut, cacao and oil palm.

In the case of village production, some constraint appears to have been placed on individual effort and investment by the traditional land tenure system with its heavy emphasis on clan or community ownership. Some 97 per cent of land in the Territory is held and used under native

custom. Group ownership is firmly established as the basic form of land tenure whereas individual ownership is not frequently seen under customary tenure and is not greatly sought after. Grove⁶ has aptly noted that 'under the distinctive social system within which most communities in this Territory operate, and the bush fallow system of agriculture which most of these communities employ, a general change to an individual form of title would be quite unnecessary, and could be positively disruptive'. There are nevertheless advantages to be gained from the registration of land rights in areas where commercial agriculture is developing or where disputes over ownership are occurring. This need not necessarily involve the registration of individual rights, although the latter could be expected to assist commercial agriculture in areas where there is already a trend towards individualisation.

The process of converting land held under customary rights—first to communal ownership and then the sub-division of a portion of this into blocks under individual title—has been largely confined to the Northern district where the procedures have remained on an experimental basis. Major problems have been the considerable cost of tenure conversion—assessed by Morawetz⁷ at about \$116 per block of 20 acres, or \$6 per acre—and difficulties in preventing the reversion to fragmented use of holdings.

Legislation has now been introduced which could lead to the systematic determination of ownership, in selected areas, with the objective of recording the title to all land within these areas. To ensure that the land register is kept up-dated, the Administration proposes to establish a decentralized register in these localities. The new legislation and procedures should make possible the conversion from customary rights to individual rights in some cases, but in view of the substantial expense and manpower involved in the registration of either group or individual ownership, effort will be concentrated in selected areas of known potential and areas where registration will serve some special purpose. Some sporadic registration is nevertheless desirable to meet the needs of progressive and energetic farmers outside the systematic adjudication areas.

Transport and Communications

Pending the receipt of a consultant's report on the Territory's transport requirements, provision was made in the five year development programme for capital works expenditure on transport totalling \$92 million. This included Administration and Local Government expenditures on roads, wharves, coastal shipping and air strips, and Commonwealth expenditure through the Department of Civil Aviation. A further amount of \$17 million was proposed to be applied to the extension and upgrading of the telecommunications network, financed in part by the World Bank. Progress on the latter project is now well advanced. As the recommendations of the transport consultants were not received until 1970, however, there has been a delay in the commencement of a number of major transport projects. This delay is unlikely to have seriously affected achievement of the agricultural programme. The deferment of

⁶ Grove, D. S. 'Land Tenure and Development'. Paper presented to the Fifth Congress of the Association of Surveyors of Papua and New Guinea, 1970.

⁷ Morawetz, D. *Land Tenure Conversion in the Northern District of Papua*. New Guinea Research Bulletin, No. 17. A.N.U. Press, Canberra, 1967.

part of the trunk road programme was in fact partly offset by increased expenditures on 'village' roads which, although constructed primarily for social and administrative purposes, assist in the marketing of village crops and provide some incentive for commercial plantings.

It is difficult to assess the contribution which expenditures on transport make to agricultural development, through the opening up of new land or the additional incentives to market produce from areas of existing production. In a study of the economic effects of an expenditure of \$646,000 on the Port Moresby-Rigo road, Ward⁸ reported a substantial stimulus to village agriculture. This expansion was considered to have occurred with virtually no assistance or encouragement from outside sources, although there was the substantial stimulus of the large and growing market for fresh foods in Port Moresby.

The Highlands districts, where the major outlays on road construction have been concentrated, offer evidence of the value of improved communications, providing there are adequate supporting incentives for development. An extensive system of local road access, air transport and later a road link to the overseas port at Lae provided important ingredients for the growth in Highlands production of coffee, tea, cattle and minor crops. More recently, improvements in the road linking Lae to Mt Hagen have reduced freight costs from 3.7 cents per lb. in 1966 to 1.5 cents at present and perhaps 0.75 cents within five years. The stimulus for indigenous participation goes beyond the transport system, however, and is probably found in expatriate involvement in plantation and trading activities; the provision of agricultural extension and marketing services; the concomitant growth in community health and education services; and the increased contact with the expatriate-based commercial exchange economy.

A rapid growth in commercial output appears to follow major outlays on trunk road construction only where there are sizeable pockets of existing development, or where substantial supporting efforts are made to stimulate production. In the absence of adequate 'follow-up' action, the increase in agricultural activities can be quite slow, as evidenced in the Northern district following the expenditure of \$1.1 million on the Kokoda-Popondetta road. In this particular case, problems of land ownership are possibly the over-riding constraint. One conclusion to be reached is that, ideally, major road projects should be programmed jointly with proposals for agricultural extension, marketing, land rationalization and other efforts aimed at promoting development in the region served by the road.

Credit Arrangements

The role of credit in fostering agricultural development in a low-income economy is far from clear. Penny⁹ claims that the importance of cheaper credit for farmers is often overstated and the provision of credit is too readily accepted as a non-controversial measure in preference to more direct means of stimulating development. On the basis of a Sumatran study, Penny showed that low income farmers were not

⁸ Ward, Marion W. *The Rigo Road*. New Guinea Research Bulletin, No. 33 A.N.U. Press, Canberra, 1970.

⁹ Penny, D. H. 'Farm Credit Policy in the Early Stages of Agricultural Development'. *Australian Journal of Agricultural Economics*, 12(1): 32-45, June 1968.

aware of the extent to which they could themselves mobilize funds for investment, nor of the means to use capital productively.

The shortage of capital is probably not a major constraint on indigenous agriculture in Papua and New Guinea. Within the village environment there is virtually no need for credit apart from the establishment costs of crop processing, livestock and fencing. Where formal settlement schemes are involved, the need for credit can extend to housing, subsistence during the initial establishment phase, and some on-farm costs of development. There is an obvious need for credit in cases such as the Cape Hoskins oil palm project where blocks are partially cleared by the Administration but the costs of clearing and housing are covered by a Development Bank loan to the settler. Under less formal conditions of settlement, the need for credit may be quite limited, although in some instances the availability of credit appears to be an added stimulus to development. Yeats¹⁰ has noted that in the three most advanced and successful coconut settlement schemes, Dagi in West New Britain and Situm and Gebari in the Morobe district, development has exceeded the budget estimate with smaller drawing of loan money than expected.

The Papua and New Guinea Development Bank, which was established in July, 1967, has become a major source of rural credit and virtually the sole source of credit for indigenous growers. Details of Development Bank loan approvals are shown in Table 3. In the case of the major trading banks, outstanding advances to the rural industries amount to some \$4 million and account for about 15 per cent of total advances. Seasonal finance is also provided by the Rural Credits Department of the Reserve Bank to a marketing authority and to co-operatives for the purchase and processing of copra, coffee and cocoa. The Ex-Servicemen's Credit Board and the Native Loans Board are now incorporated within the structure of the Development Bank. At the point of takeover, early in 1969, outstanding balances amounted to \$7.3 million. Another source of rural credit has been the Savings and Loan Society movement which has lent about \$600,000 since its inception.

As at June, 1970, the Papua and New Guinea Development Bank had approved 2,718 loans, for all purposes, totalling \$13.1 million and had taken equity in 10 local companies amounting to about \$3 million. Loan balances outstanding at that date (excluding the Ex-Servicemen's Credit Board and Native Loans Board) amounted to \$7.4 million.

The rural industries accounted for 42 per cent of the value of approvals negotiated by the Development Bank to June, 1970. During this period the Bank maintained a liberal advances policy with emphasis upon lending to the indigenous sector. Of the 2,718 loans approved, 2,214 were made to Papuans and New Guineans. In terms of the value of the loan, however, 74 per cent of approvals were made to non-indigenes or to joint ventures.

It is to be expected that the amounts advanced to individual Papuans and New Guineans will be quite small at this stage. The number of indigenous applicants with reasonable prospects for success has also been limited and 50 per cent of the value of approvals to indigenes have

¹⁰ Yeats, G. 'Economic Aspects of Smallholder Primary Production in Papua—New Guinea'. Rural Digest. Department of Agriculture, Stock and Fisheries, Port Moresby, December, 1969.

TABLE 3

*Papua and New Guinea Development Bank
Loan Approvals Classified by Industry*

Classification	Total Approvals to June, 1970.	
	No.	Value (\$'000)
Rural: Oil Palm	950	1,778.8
Coconut	341	359.4
Cocoa	142	293.4
Tea	7	700.2
Rubber	34	85.6
Coffee	13	126.3
Cattle	290	1,486.4
Other	179	660.0
Total	1,956	5,490.1
Commercial	641	5,939.6
Industrial	121	1,676.7
Total Approvals	2,718	13,106.4

Source: Papua and New Guinea Development Bank.

in fact gone to smallholders on Administration sponsored settlement schemes.

The problems of land ownership have particular relevance to bank lending. Papuans and New Guineans outside settlement areas are normally using land to which they have no more than a right of use and for which there is no recorded title. Mortgage loans therefore have little application. Providing there is sufficient evidence to show that the borrower has usage rights under local custom, however, the Development Bank has provided finance on the basis of an agreement in which clan leaders acknowledge the borrower's right to use the land. In its Third Annual Report, the Bank noted that 'while it is doubtful that the clan usage agreement has legal status, the system has worked well to date and it is planned to extend up to 10 years (perhaps longer in special cases) the loan term for tree crops. This is expected to open up wider avenues for lending for development at the village level'.¹¹

The development programme envisaged that sources of international finance would contribute up to \$5 million towards the farm credit and infrastructure expenses of the agricultural and livestock programme. In fact, the International Development Association has already approved provision of \$US 6.5 million for agricultural and pastoral projects and World Bank funds have been approved for projects outside the rural sector. It is possible that within the period of the five year programme, international loans of the order of \$US 64 million will be approved for agricultural, pastoral, transport, communications and power projects. As Papua and New Guinea is now an associate member of ECAFE, the Territory is also eligible to apply for assistance from the Asian Development Bank. The extent of the investigation and negotiations required to secure international assistance has not always been foreseen, however, and the resulting delays have affected progress not only of agricultural

¹¹ Papua and New Guinea Development Bank. *Annual Report and Financial Statements, 1969*. p. 11.

and livestock projects, but also of major transport and telecommunications projects.

Under existing arrangements, the International Development Association has approved the provision of \$US 6.5 million to be used in planting or replanting 10,000 acres of coconut on existing estates; the development and stocking of 150,000 acres of beef cattle land; the establishment of 1,560 smallholders to grow 12,440 acres of oil palm; and the construction of wharf facilities to service the oil palm project. The total cost of the projects to be financed with this credit is approximately \$US 12.0 million of which the balance will be met in part by the Administration and in part by graziers and planters. An amount of approximately \$US 3.1 million is to be made available to the Development Bank for relending to graziers and coconut planters and to smallholders for on-farm development and subsistence during the initial period of oil palm planting.

Beyond the Development Programme

With the exploitation of its mineral, timber and fishing resources, Papua and New Guinea is rapidly moving to a position where the agricultural industries contribute an important part, but by no means the major part of the Territory's export earnings. At the same time, major changes are occurring in the economic, social and political framework within which the rural industries must develop. Many of these—the inflow of international funds, shortages of skilled manpower, improved knowledge of particular projects and development opportunities, and increased indigenous involvement at all levels of government and economic activity—were in part induced by policies incorporated in the five year development programme. The implications of other changes, particularly those associated with major mining developments and the growing reluctance of expatriate planters to re-invest in tree crops, were less clearly foreseen in the preparation of the development programme. Under these circumstances, some revision of the programme is called for and is in fact being undertaken.

Any revision of the agricultural programme can be expected to place considerably less reliance on estate production of tree crops other than oil palm. In the indigenous sector, emphasis will be upon individual and group effort at the village level in preference to formal settlement—a departure supported by the proposed legislation to simplify the registration and transfer of land. Some redirection of effort seems likely in favour of the commercial output of tobacco, fruit, vegetables, rice, sorghum, poultry, beef and perhaps sugar produced for the expanding local market. In some areas the demand can be met by traditional means of subsistence production, but the concentration of population in the major urban and mining centres will provide increasing opportunities for specialized and commercial production.

The changing pattern of indigenous farming is already apparent in the growth of a cattle industry and proposals to establish a beef herd of at least 300,000 head. The output of beef should be readily absorbed by the partial replacement of imports, increased consumption in the urban areas, and the changing dietary habits of the indigenous people. Production of rice for the local market has also been increasing, but problems in the storage, milling and distribution of the grain have still to be re-

solved. About 2,000 tons of rice are produced by indigenous growers, compared with annual imports of the order of 43,000 tons. Any attempt to produce rice on a scale to replace imports is likely to come mainly from the Markham Valley where trial plots have indicated good yields from new rice strains.

Consideration is being given to the local production of cane sugar to replace imports which currently total about 17,000 tons. Production would probably be confined to the Markham Valley and would require substantial expatriate investment. Trial plantings are being undertaken to verify observations made at the experimental level in respect to disease and pest patterns, but in view of the need to build up supplies of planting material, commercial plantings are not expected before 1974.

Notwithstanding the increasing effort devoted to production for the local market, the bulk of the indigenous people will continue to contact the cash economy through the sporadic sale of copra, coffee, cocoa, pyrethrum and other crops grown for export. The dilemma here is that although alternative employment opportunities are limited, the low cash incomes earned by indigenous growers are not conducive to the promotion of many of these crops and severely restrict the Territory's tax base. The net cash return per man-day worked is of the order of \$1.00 for tea, \$1.25 for rubber and copra, \$1.75 for coffee and cocoa, and \$6.40 for oil palm. Assuming 160 man-days per year are devoted to the crop, a family would earn about \$160 from tea, \$200-\$300 from coffee, cocoa, copra or rubber, and \$1,020 from oil palm. Where the activity is centred about the village environment, however, substantially less effort is likely to be devoted to the cash crop. Crocombe and Hogbin comment that in the village context 'it is unlikely that the average man could, after meeting his family's subsistence needs and social commitments, clear and maintain more than two and a half acres of coffee or cocoa. This would yield no income for the first four years and a maximum of \$200 per year thereafter at current prices'.¹²

The problem of low farm incomes is linked to the Territory's dependence on tropical tree crops subject to the vagaries of world markets. It is also bound to the scale of production and difficulties in adapting to the work patterns required for commercial agriculture. At the present time the most promising crop for fully commercial indigenous farming is oil palm. The area of oil palm planted per settler is ahead of schedule and there is every indication that settlers will attain a minimum of 8 acres of crop, returning \$1,400 per year. At this stage, however, the area of oil palm is confined to some 6,000 acres of indigenous crop and 4,000 acres of plantation at Cape Hoskins in West New Britain. The indigenous growers in this project have been very closely supervised and supported by substantial expenditures on the part of the Administration and the associated plantation/factory complex—financed on a 50/50 basis by the Administration and the company concerned.

There are instances where other crops and cattle holdings have been established on a substantial scale by individual growers, but for the most part cash cropping continues to be carried out as a supplement to subsistence gardening. In such cases the monetary return from cash cropping alone gives an inadequate indication of the levels of living

¹² Crocombe, R. G. and Hogbin, G. R. *Land, Work and Productivity at Inonda*. New Guinea Research Bulletin, No. 2 A.N.U. Press, Canberra, 1963.

enjoyed at the village level. Papua and New Guinea is in the favoured position that its rural population is already comparatively affluent and even at the lower levels of cash income a family can normally enjoy a reasonable level of rural living. As noted by Williams¹³, a development programme in these circumstances can afford to aim at improving the productivity of agriculture in both its subsistence and cash cropping aspects, while at the same time remedying such deficiencies in rural life as lack of medical care, education and communications. 'Providing an adequate level of nutrition is probably more a matter of education and greater diversification of agriculture than something which would need a large amount of investment or major changes in techniques. The income from cash crops, even if not grown on a strictly commercial basis, should be enough to provide better services than most countries can afford'.¹⁴

There nevertheless remains the problem of ensuring that Papuans and New Guineans who prefer and are capable of engaging full time in commercial agriculture have the opportunity to achieve a standard of living approaching that of urban workers. It is here that the extension services and Development Bank can play an important role in identifying and assisting those indigenes who have the capacity and drive to establish and manage fully commercial holdings. This is in fact occurring, as evidenced by a loan of \$28,000 approved by the Development Bank for one indigenous beef cattle producer. The proposals for registering customary land in some areas and the trend towards individually registered titles should likewise go a long way towards supporting the move to commercially viable holdings.

¹³ Williams, J. W. *Economic Development*. University of Papua and New Guinea, October, 1968.

¹⁴ *ibid.* p. 8.