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Report No. 1400

Project Performance Audit Report

PNG - NEW BRITAIN SMALLHOLDER DEVELOPMENT PROJECT

(Credit 137-PNG and Credit 175-PNG (part))

December 28, 1976

Operations Evaluation Department

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Currency Equivalents

A\$1	=	US\$1.12	(1967-1970)
	=	US\$1.13 - 1.19	(1971)
	=	US\$1.19 - 1.28	(1972)
	=	US\$1.42 - 1.49	(1973)
	=	US\$1.49 - 1.31	(1974)
	=	US\$1.35 - 1.26	(1975)
K1	=	US\$1.27	(1976)

Weights and Measures

1 hectare (ha)	=	2.47 acres
1 kilometer (km)	=	0.62 miles
1 metric ton	=	2,206 lbs.

Abbreviations

ARI	Appraisal Report, Cr. 137
ARII	Appraisal Report, Cr. 175
DASF	Department of Agriculture, Stock and Fisheries
FELDA	Federal Land Development Authority (Malaysia)
FFB	Fresh Fruit Bunch
GOA	Government of the Commonwealth of Australia
HCG	Harrisons & Crosfield Group
IDA	I nternational D evelopment A ssociation
IBRD	International Bank for Reconstruction and Development
NBPOD	New Britain Palm Oil Development Ltd.
PNG	Papua New Guinea
PNGDB	Papua New Guinea Development Bank
TA	Territorial Administration
Bank	Refers to the World Bank Group, including IBRD and IDA. In this report IDA usually refers to the financial instrumentation and Bank the administrative authority.

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Project Performance Audit Report

PNG - NEW BRITAIN SMALLHOLDER DEVELOPMENT PROJECT
(Credit 137-PNG and Credit 175-PNG (part))

PREFACE

This paper presents the results of an audit of accomplishments under Credit 137-PNG, signed in January 1969 for US\$1.5 million, and under those parts of Credit 175-PNG, signed in January 1970 for US\$5.0 million, allocated to the oil palm settlement project at Hoskins. The Department of Agriculture, Stock and Fisheries (now Department of Primary Industries) of the then Territorial Administration (now Government of Papua New Guinea) submitted a draft evaluation report to the Bank in December 1974, and that document was subsequently issued in May 1975, with a summary statement by the East Asia and Pacific Regional Office, as the project completion report (PCR). The PCR was an important source of material for the audit review, but, since much of the PCR is devoted to a discussion of current issues and problems to avoid in subsequent smallholder projects, it is not attached to this paper. Interested readers may obtain a copy from the General Agriculture Division of the Regional Office. The OED audit was based also on a review of Bank files, discussions with Bank staff, discussions with project staff in Port Moresby and at Hoskins in November 1975, and substantial comment from Government and the company on the nucleus estate on an earlier draft.

A detailed supplementary report is attached to the main audit report. One reason for preparing a rather lengthy statement on this project - the first of the Bank's East Asian tree crop projects to be reviewed by OED - was to provide a basis for comparison of similar projects in the future.

The generous assistance of Government in preparing the original draft PCR and in facilitating the audit review and field visit is appreciated.

BASIC DATA SHEET

PNG: NEW BRITAIN SMALLHOLDER DEVELOPMENT PROJECT (CREDIT 137-PNG)

A. Amounts (in US\$ mln)

	<u>Original</u>	<u>Disbursed</u>	<u>Cancelled</u>	<u>Repaid</u>	<u>Outstanding</u>
Credit 137	1.500	1.459	0.041	0	1.459

B. Project Data

	<u>Original Plan</u>	<u>Revisions</u>	<u>Actual</u>	Exchange Adjustment
First Mention in Bank Files	1966			
Government Application	Oct. 1966			
Board Approval	Early 1968		1/14/69	
Credit Agreement	Early 1968		1/21/69	
Credit Effectiveness	5/16/69		7/15/69	
Physical Completion	6/72		12/73	
Percentage of Original Project actually completed	100%		100+	
Last Disbursement			3/31/74	
Loan Closing	12/31/72	12/31/73, 3/31/74	3/31/74	
Total Costs	US\$3.35		US\$4.31	
Economic Rate of Return	9%		over 9%	

C. Mission Data

	<u>Sent by</u>	<u>Month, Year</u>	<u>No. of Persons</u>	<u>No. of Weeks</u>	<u>Manweeks</u>	<u>Date of Report</u>
Identification	Bank	March 67	1	3	1	Aug. 67
Preparation	HCG					
Preappraisal	Bank	July 67	1	1	1/2	-
Appraisal	Bank	Jan.-Feb. 68	5	5	10	Dec. 68
Subtotal						
Supervision I ^{2/}		May-June 69	2	2	2	June 69
Supervision II ^{3/}		June 70	3	1	3	July 70
Supervision III		May-June 71	2	2	3	July 71
Supervision IV		May-June 72	2	1	2	July 72
Supervision V		May 73	2	1	2	June 73
Supervision VI		March 74	4	1	3	May 74
PCR ^{3/}		Feb.-March 75	5	4	2	April 75
Subtotal			1/	1/	19 ^{1/}	

D. Follow-on Project:

Credit 175-PNG of US\$5.0 mln, signed 1/30/70 for Agriculture Development Project.

^{1/} No. of weeks and No. of Persons give total Mission figures, including multiple assignments. Manweeks gives estimate of time devoted to Hoskins affairs, there or in Port Moresby.

^{2/} Supervision Mission I for Cr. 137 served as Appraisal Mission for Cr. 175.

^{3/} Supervision Missions II - VI, for Cr. 137, plus the PCR Mission, served as Supervision Missions I - VI for Cr. 175. Missions I thru VIII for Cr. 175 each performed other appraisal and supervision work.

BASIC DATA SHEET

PNG: AGRICULTURAL DEVELOPMENT PROJECT (CREDIT 175-PNG)^{4/}

A. <u>Amounts (in US\$ mln)</u>	<u>Original</u>	<u>Disbursed</u>	<u>Cancelled</u>	<u>Repaid</u>	<u>Outstanding</u>
Credit 175	5.000	5.000	0	0	5.000
					+0.519 Exchange Adjustment

B. <u>Project Data</u>	<u>Original Plan</u>	<u>Revisions</u>	<u>Actual</u>
First Mention in Bank Files	1966		
Government Application	Oct. 1966		
Board Approval	Early 1968		1/13/70
Credit Agreement	Mid 1968		1/30/70
Credit Effectiveness	5/29/70		6/3/70
Physical Completion	6/74		6/76
Percentage of Original Project actually completed	100%		100+%
Last Disbursement			
Loan Closing	6/30/74	6/30/75, 6/30/76	6/16/76
Total Costs	n.a.		n.a.
Economic Rate of Return	20%		over 20%

C. <u>Mission Data</u>	<u>Sent by</u>	<u>Month, Year</u>	<u>No. of Persons</u>	<u>No. of Weeks</u>	<u>Manweeks</u>	<u>Date of Report</u>
Identification		-				
Preparation		-				
Preappraisal		-				
Appraisal ^{2/}	Bank	May-June 69	2	2	2	December 69
Subtotal						
Supervision I	}	Same as Supervision Missions II-VI + PCR Mission for Cr. 137. ^{3/}				
Supervision II						
Supervision III						
Supervision IV						
Supervision V						
Supervision VI						
Supervision VII		Aug.-Sept. 75	3	1	1	November 75
Supervision VIII		June 76	2	2	1 ^{1/}	July 76 est.
Subtotal			<u>1/</u>	<u>1/</u>	19 ^{1/}	

D. Follow-on Project: Under Discussion

^{1/} No. of weeks and No. of Persons give total Mission figures, including multiple assignments. Manweeks gives estimate of time devoted to Hoskins affairs, there or in Port Moresby.

^{2/} Supervision Mission I for Cr. 137 served as Appraisal Mission for Cr. 175.

^{3/} Supervision Missions II-VI, for Cr. 137, plus the PCR Mission, served as Supervision Missions I-VI for Cr. 175. Missions I thru VIII for Cr. 175 each performed other appraisal and supervision work.

^{4/} Part A refers to total Credit; Parts B, C and D, refer to Hoskins components, except as indicated in footnote ^{1/}.

Project Performance Audit Report

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HIGHLIGHTS

IDA provided a total of US\$4.9 million in two credits signed in 1969 and 1970 to support smallholder settlement in association with a nucleus oil palm estate near Hoskins on the north coast of New Britain. Approximately 1,600 settlers are involved, each planting and maintaining 8 or 10 acres of palm. The first settlers began to harvest in 1971, earlier than expected and with exceptionally high average and peak yields. The farm production record, coinciding with a period of high prices for palm oil, gives the project a well deserved image of success, marred only by the fact that heavy and early production overloaded the new mill, resulting in processing bottlenecks only now being left behind. The newly independent Government is proceeding with plans for other oil palm projects modeled after the Hoskins plan as adjusted by experience.

Three factors seem to explain the success of the smallholder scheme: the fertility of these virgin, volcanic soils, the settler's capacity for work, and the flexible and pragmatic administrative skills of the Australian territorial staff. The last factor raises the issue of replicability: future projects will have to be based on a management system reflecting post Independence staffing patterns.

The main lessons for the Bank for similar nucleus estate tree crop projects are that settlement on a remote frontier can be made to work well, settlement should lag behind development of the estate by two years, and the Bank has to review developments at the mills as intently as developments on the farms.

The following issues may be of particular interest:(paragraph numbers refer to the supplementary report):

Lag of IDA disbursements and its policies for retroactive finance (paras. 2.06-2.10, 7.11-7.12, 8.03)

IDA's weak position at the mill (paras. 2.13-2.15, 4.15, 5.03, 7.02-7.07)

Changes in settlement plans to reflect experience (paras. 4.02-4.04)

Legal constraints on expeditious settlement policies (para. 4.16 (5))

Impact of wide price fluctuations on tree crop settlements
(paras. 5.05-5.07, 5.09)

Lack of alternative employment opportunities (paras. 6.04,
6.16, 8.04-8.05)

Success with the substantial self-help component
(paras. 6.08-6.09)

High per capita costs of settlement even with modest income
targets (paras. 6.10-6.12, 8.05)

Replicability (paras. 8.01-8.02)

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Introduction

1. The audit covered the two phases of a smallholder oil palm settlement scheme associated with a nucleus company estate and mill on the northern coast of New Britain. Phase one was partially financed by Credit 137-PNG for US\$1.5 million (signed January 1969); phase two, plus a deep water docking facility at the town of Kimbe, were partially financed by Credit 175-PNG for US\$5.0 million (signed January 1970). The US\$5.0 million also included funds -- US\$1.6 million when the credit was fully disbursed in June 1976 -- for a livestock subproject that was not covered by the audit. The audit reviewed expenditures on all settlement and related activities since they were initiated in late 1967, not just the activities financed by the IDA credits. The settlement activities are referred to in the report as the Smallholder Project. The larger program is referred to as the Hoskins program, Hoskins being the name of the administrative center of the district.

2. In 1964-65, when the Program was originally formulated, Papua New Guinea (PNG) produced no palm oil. However, experts from Malaysia were guessing correctly that, if the logistics of estate and settlement developments could be successfully managed on the remote New Britain frontier, oil palm yields on a commercial basis would exceed existing world records. PNG, which became independent of Australian rule in September 1975, plans to proceed with several other oil palm settlements on the basis of the success at Hoskins.

Objectives

3. The principal goal of the Hoskins Program was to diversify and increase the production of crops for export, making use of underdeveloped, fertile, agricultural lands. Settlement objectives were set forth as well, particularly to test some new policies for successful settlement in the Territory. **These** objectives must be considered secondary to the principal production thrust. Nevertheless, the procedures for settler selection, organization, self help, finance, etc., as adjusted and perfected during the Hoskins experiment, have been incorporated in subsequent proposals.

Principal Results

4. By November 1975 a total of 13,700 acres of oil palm had been planted by 1,548 smallholders, one-third of the total on the three subdivisions of phase one and two-thirds on the four subdivisions of phase two. Another 43 blocks had been allocated but not occupied. At full

occupancy the total will slightly exceed the target. The approximately 1,600 settlement blocks will include 14,000 acres of palm. Another 1,300 acres have been planted on 180 blocks by local villagers, also under the supervision of the Project Authority. To date, 6,200 acres have been planted on the estate. Each settler block comprises 15 acres, 8 to 10 of which are planted with palms, leaving the settlers with an area for subsistence plots and, it is hoped, expansion into other commercial crops.

5. The Project must be considered a success with respect to all its major objectives -- production, export earnings, stable settlement and smallholder prosperity. There were start-up problems at the mill, which have provoked criticism, but these problems were to a large extent the consequence of the main element of success itself, the unexpected, excellent, early smallholder harvest. If one tries to discern the elements of success, three seem to dominate. First, the geographic conditions of this well-chosen site were ideal, though remote. Second, the settlers were prepared to work hard for three years without cash returns. Third, the expatriate Project field officers, many of them trained in PNG's unique wilderness and accustomed to finding extraordinary solutions to major and minor crises, held the project to its timetable. Enthusiasm and determination were also shown by company senior staff.

6. The project may not be easy to replicate, however. Although similar soil conditions exist elsewhere in the country, and smallholder vigor presumably is undiminished, the administrative superstructure in Port Moresby changed following home rule and independence. The third vital element of success mentioned in the last paragraph, the effective, flexible management system, would accordingly have to be redesigned if the project is to be replicated, so that it depended much less on the expatriates' "old boy" relationships across agency lines and much more on well defined assignments for the several ministries, as well as on empowerment of the project unit to command other governmental resources.

7. The level and quality of production of palm fruit by both settlers and estate has been remarkable, passing world records. The best settlers can exceed estate records; the average settlers produce an estimated 8.3 MT of fresh fruit bunches per acre per year, roughly 75% of the estate performance. Not only are production levels high, but the harvest began 2 1/2 years after planting, that is, 1/2 year earlier than expected, and reached peak levels almost immediately, evidence of the excellent natural fertility of the soil (the nearby Dami Research Station, now owned by the company, is pursuing fertility and nutrient studies).

8. The farm production success has not been fully reflected yet in palm oil and kernel production and export because of the mill bottlenecks, hopefully now largely passed. Nevertheless, OED expects that the overall volume of export of smallholder palm oil from Kimbe will exceed by some 10% appraisal forecasts for the decade 1971-80.

9. Project success was amplified by the high international prices of fats and oils received in the first year of production 1971/72, and by the next, phenomenal increase in 1973/74. Prices declined drastically in 1975 and have levelled off at a point roughly equal to appraisal forecasts. The movement of prices in both directions caught the Project Authority by surprise, and it has tried, with difficulty, to explain to the illiterate settlers the economic influences involved. Smallholders in the last two subdivisions missed the period of high prices altogether. There has been some agitation by the settlers, but the Project Authority does not think it involves the majority of farmers. There is no price stabilization fund or immediate plans for one.

10. Updated estimates of rates of return and annual incomes are higher than forecast at appraisal. Financial returns to all investments on the average settler block are expected to be above 30%, though the phase one cohorts, which caught all of the high price period, should do even better. Almost all of the phase one settlers paid off their debts within four years of first harvest, less than half the nine years anticipated at appraisal. Average annual family incomes are expected to level off at US\$1,900 compared with approximately US\$1,300 forecast at appraisal (both figures at 1976 prices). The economic rate of return to the Smallholder Project, as distinguished from the Hoskins Program as a whole, is estimated by OED at 19%. The appraisal report for Cr. 175 estimated 15% for the Program including the two phases strung together. These returns do not include benefits to the town and hinterland of Kimbe, including the village populations. The town, formerly a fishing village, now provides most public services and is attracting industries.

11. The continued success of the project is dependent on the world palm oil market. Reasonable forecasts of palm oil prices suggest a level of family annual earnings clearly higher than in the tribal areas where most of the settlers originated, but the relevant comparison is not with cash earnings in the tribal economy but with rising settler expectations. In this sense a partial solution to the second generation problem of providing supplementary employment opportunities in the project area, especially for the superfluous adults and youth in the subdivisions, may in the long run prove essential if a relatively stable, family settlement is to be created. Without supplementary jobs, the level of underemployment is likely to increase.

12. There may be no short-term solution to this potential problem, and in any case it cannot be demonstrated yet that idleness is a threat to settlement. Some persons in the Bank argue it is an unavoidable and acceptable consequence of keeping settler earnings below levels which would clearly raise the envy and concern of less fortunate countrymen, though it must be remembered that average annual family incomes at Hoskins are already projected at US\$1,900, well above the per capita GNP. An attractive alternative route may be to encourage the periodic movement of adults and cash earnings back to the tribal homelands, to invest in profitable opportunities there.

Costs

13. The cost of the settler's airfare to New Britain, of felling trees, of palm seedlings, of a monthly cash subsistence allowance, of a house (without electricity or piped water), etc., were lumped together in a debt, initially set at US\$2,230 per settler, though rising with inflation to US\$3,260 in 1975. The charge did not include the costs of infrastructure and the village center, or of extension and other official services. Repayments were collected at the mill, on behalf of the new Papua New Guinea Development Bank (PNGDB), by deductions from cash earnings.

14. Total costs of the Smallholder Project were approximately US\$8.7 million, of which IDA financed US\$4.2 million, a share (48%) slightly higher than that previewed in the appraisal reports. The figures hide partly offsetting increases and decreases in unit costs, with a net increase of total costs of 9% over the combined appraisal estimate for both phases. Another US\$0.9 million financed the wharf, which suffered a negligible cost overrun.

Preparation Delays

15. The bright prospects for oil palm in the then Territory of PNG were first described by the Bank in its 1964 economic survey report. The Hoskins Program took shape over the next three years with practically no Bank involvement. The Harrisons & Crosfield Group (HCG), one of the foremost private companies experienced in oil palm development and palm oil production, carried the main responsibility, at the urging of the Government of Australia (GOA), for survey, trials and preparation of a project proposal for the Bank. The proposal, including estate and settlement, was forwarded to the Bank in 1966. However Cr. 137 was only signed in January 1969, by which time project activities were well along the critical path established by palm seed plantings: much of the heavy construction work had been accomplished and settlement of the first two subdivisions of phase one was largely complete.

16. There were several reasons why Cr. 137 was delayed. The Bank tried to group the Hoskins proposal with several other agricultural subprojects under an omnibus agricultural credit project, partly to strengthen the new PNGDB, partly to overcome the diseconomies of small size of the individual subprojects. Appraisal, starting in January 1968, reviewed the broader project and that was the subject of an appraisal report on a credit of US\$6.0 million. The delay in IDA replenishment interrupted negotiations, however, and only then was it decided to proceed independently with the Hoskins component, and a credit of US\$1.5 million.

17. IDA delays did not affect the oil palm components of Cr. 175. The latter was intended to finance the remaining pieces of the earlier US\$6.0 million proposal, but its appraisal was accelerated in response to growing optimism at the Hoskins site. The new credit was expanded to include phase two settlement activities, which had been advanced by one year.

Implementation Problems

18. The settlement activity proceeded more or less on schedule, a phenomenal performance for the wilderness. The palm oil processing operation at the mill fell behind schedule, however, soon after the year of commissioning (1971), under the strain of unexpectedly rapid and prolific production of the palm fruit. The first press line could not cope, and efforts to keep the first press operating, and to accelerate installation of the second line were frustrated by shipping shortages, staff shortages, impure water supplies, and inadequate machinery. Consequences of these mill problems were reflected in the long interval between pick up rounds, low extraction rates, high free fatty acid content, and, on one occasion, the loss of half the estate's crop. The second line was finally commissioned in 1975, and the mill problems gradually are being eliminated.

19. A number of other problems have faced the Project Authority and IDA: (1) the proposed cooperative transport company could not be organized, so the company has always had to pick up settler as well as estate fruit; (2) hand pollination will be necessary for a period of years much longer than anticipated, which implies that individual settler production levels will continue to reflect variable performance with pollination; (3) the quality and quantity of Project Authority reporting to IDA fell far short of agreed standards in all but the last few years; (4) 10% of the settled smallholders are judged now to have been poorly selected, and selection criteria were revised; (5) another 10% of the selected individuals never took up their plots, and attempts to expedite the forfeiture of their lease rights, and those also of the worst performers, have been thwarted by legal obstacles.

20. The Project Authority was independent of but staffed mostly by the Department of Agriculture, Stock and Fisheries (DASF). A special administrative formula placed an overall project director (Project Coordinator, HQ) in Port Moresby and an area director (Project Coordinator, Field) at Kimbe. The institutional arrangements worked well throughout the main period of site development, resettlement and planting. However, the system was weakened by the appearance of ministerial jurisdictions which accompanied self-government in 1973, and Project Authority management is concerned that the success of future schemes will depend on better definition of agency responsibilities and project unit authority. Replication must in any case take a somewhat different course because the high percentage of Australians, in senior positions of all involved agencies, has been cut.

Special Issues

21. Ten issues were given special attention in the audit, most of which were selected because they arise in other Bank-supported tree crop settlement schemes, especially those in Malaysia.

(A) Settlement Stability. All evidence suggests that as long as farmgate prices remain reasonably attractive, the settlers, or at least members and relatives of the original settling family, will stay at Hoskins. Permanence was one of the uncertain variables at appraisal.

(B) Secondary Jobs. The Project Authority has not had the time to concentrate on the difficult task of encouraging the development of employment opportunities outside of the settler and estate palm plantations. This may be one of the major second generation problems at Hoskins, since the 8 to 10 acre palm blocks cannot fully occupy more than one adult.

(C) Consumption. The Hoskins subdivisions lack the visible signs of rapidly rising consumption standards that are the pride of settlement officers in Malaysia. A consumer market of growing proportions remains to be tapped, once it is understood.

(D) Tribal Origins and Disputes. Eighty-five percent of the settlers originated in three small areas of PNG (see map insert), and, not unexpectedly, there have been major battles between tribes on the settlements and the estate. The Project Authority designed the block layout, and the block allocations (the settlers live on their blocks), to minimize the sources of tension, and has taken quick and heavy-handed action to stop the fights. The problem is smaller than expected (by some) and seems to be abating.

(E) Self-Help. The settlers arrived just after the timber had been felled, and were obliged to perform most of the block development operations -- clearing, planting, and maintenance -- of the pre-production period. The system worked, though not without the exhortation of field staff and the occasional threat of eviction. A few jobs the settler proved generally incompetent to do by himself were turned over to contract management, using, as in the case of houses, the settler thereafter as an unskilled laborer. The self help load was much higher than in Malaysia. That it was carried successfully in PNG surprised some early criticism, though it has been said that the PNG settler will work where others will not.

(F) Costs per Settler. Hoskins was a high cost settlement by PNG standards, though it is sometimes considered low cost by other standards. Average costs per settler and per planted oil palm acre are reckoned by OED at US\$5,500 and US\$630 respectively. These figures are 50% and 20% below current Malaysian averages. Both countries' experiences demonstrate that development of new resources, and job creation at modest income levels, cannot be achieved cheaply.

(G) Block vs Individual Farming. The Malaysian oil palm blocks are farmed by groups of 20 settlers who work as a unit; they live in villages and cannot identify individual properties. The PNG blocks are farmed by resident individuals. Malaysia adapted its schemes in 1969, because it doubted whether oil palm quality standards could be maintained otherwise. The Hoskins experience so far suggests that, at least in PNG, such fears could be exaggerated.

(H) Villager vs Settler Production. The Project Authority has assisted local villagers to develop blocks, on virgin land belonging to the villages, following most of the same procedures. Villager interest, availabilities, and production levels remain far below settler averages, though they are improving.

(I) Estate vs Smallholder Development. Estate production levels will continue to exceed settler averages, for reasons best explained by the variability of smallholder motivation and enterprise. Nevertheless the gap is only about 33% of the settler average. The lives of the settlers also compare favorably with laborers on the estate, though a husband-wife team working overtime on the estate can earn as much income. Attractive arguments in favor of the nucleus estate/smallholder model for tree crop development, where both sides find support in the arrangement, are themselves supported by the Hoskins experience.

(J) Project Phase Out. The graduation and phase out operation, now largely completed, seems to have been well conceived and respected. Settlers will not enjoy services continuing at a level far superior to those offered to local villagers.

Bank Performance

22. Because of the competence of the local sponsors and managers, the Bank's input into this Project was appropriately smaller than in most of the Bank's agricultural projects. Supervision was assigned to one short mission per year. PNG officials interviewed during the audit were consistently complimentary about supervision, with the exception of one experience.

23. The major weakness in Bank supervisory performance appears with hindsight to have been the permissive position adopted with respect to developments at the mill. The original proposal had called for Bank equity investment in the mill. The Bank ultimately declined to participate, partly because the plans precluded international competitive bidding. In this manner the Bank may have limited its own interests in mill activity. No Bank-sponsored engineer visited the mill from 1967 to 1974. A consultant engineer was first included on the 1974 supervision team, following the

advice of the 1973 mission (which had become alarmed at the failure to quickly overcome the problems first identified in 1972). The consultant's report was highly critical of mill operations. But the criticism has itself been challenged by project staff and opinions in the Bank appear to be divided on the issue. Another lesson, emphasized by HCG, is that "in any similar project in a similar location smallholder plantings should not be started until two years after a start is made on the nucleus plantation, (to) give (at least) a year to run in the mill and train personnel."

24. Two other comments can be made. First the effort in 1967/68 to convert the Government's proposal for a single crop production project into a component of a multi-purpose credit project, an effort that was carried forward from Cr. 137 to Cr. 175, was responsible for the Bank having almost missed the phase one expenditures it had intended to finance, without comparable benefits measured either in terms of institution building at the development bank or in terms of establishing a permanent relationship between the settler and the development bank.

25. Second, the Bank's attitude on retroactive eligibility of phase one expenditures for funding under Cr. 137 seems to have been rigid in the circumstances. Although the Bank had been substantially involved in major discussions of development strategy, and supported and encouraged preparation work, the energized project authority had to find other funds for the key settlement expenditures, with IDA funds ultimately being largely spent on other project costs, mainly roads.

26. The Bank, however, should take satisfaction in most of its decisions: supporting a risky settlement scheme, on a remote frontier, with elements of self-help, tribal confrontation, and individual proprietorship that worried many observers; the discipline on economic analysis, which caused two components of the original, 1966 US\$6.0 million proposal to be dropped and which continued to test the viability of the Hoskins proposal against conservative technical and pricing criteria as international palm oil prices deteriorated during the appraisal period; and, among others, the Bank's readiness to advance the schedule for appraisal of, and to approve finance of phase two activities, before solid evidence of high production yields was available. Some elements of the special project management system can also be traced to early and insistent Bank advice.

Project Performance Audit Supplementary Report

PNG - NEW BRITAIN SMALLHOLDER DEVELOPMENT PROJECT (Credit 137-PNG and Credit 175-PNG (part))

I. INTRODUCTION

1.01 In August 1968 the Bank and the Government of the Commonwealth of Australia (GOA) entered negotiations on a proposed IDA credit for US\$6.0 million for development of oil palm, coconut and livestock activities in the Territory of Papua New Guinea (PNG). The meetings were adjourned in September due to a delay in IDA replenishment, a temporary setback that the Bank had warned might occur. The Bank then rejected a GOA request to permit retroactive finance by the IDA credit when ultimately signed. The GOA in turn rejected a Bank offer to switch to IBRD loan terms. But the GOA accepted an alternative proposal to proceed immediately with a smaller credit for the oil palm activity. This comprised the first three-year phase of a six-year smallholder settlement scheme associated with a nucleus oil palm estate already under development on the north coast of the island of New Britain. The original Appraisal Report was cut up and redrafted, and Credit 137-PNG for US\$1.5 million was signed on January 21, 1969.

1.02 Following replenishment later in 1969, a second credit, Credit 175-PNG for US\$5.0 million, was negotiated and signed on January 30, 1970. Cr. 175 included US\$680,000 to help finance costs of a wharf at Kimbe, the then small coastal village, close to the new oil palm farms, selected for a deepwater port. Cr. 175 also included US\$1,940,000 to help finance costs of the second phase of settlement. These last costs had not been included in the 1968 US\$6.0 million package: the Bank then had not anticipated making funds available for phase two until 1971. Accelerated preparation of the second phase plans reflected the rapid progress and gathering optimism of field officers and settlers at the site. Together the wharf and phase two were expected to absorb 57% of Cr. 175 funds (excluding US\$415,000 unallocated), a figure which increased to 68% by the closing date in June 1976.

1.03 The audit was concerned with Cr. 137 and the oil palm categories of Cr. 175, including the wharf. It is possible, though with difficulty, to separate the accounts of phases one and two, since they covered distinct geographic subdivisions (see map). But the two episodes are best strung together in analysis. The rest of Cr. 175, including an expatriate large-farm livestock subproject, an expatriate coconut plantation subproject (eventually dropped without disbursement) and some minor pieces, were ignored in the audit.

1.04 The subject of this report, however, is considerably broader than the oil palm activities financed by the IDA credits. There are two reasons. First, the smallholder settlements surround the nucleus company estate at Mosa, where the palm oil mill is situated, 15 kilometers from Kimbe, and the story of the company and the settlers cannot be disassembled.

1.05 Second, the replenishment problem and other delays at IDA extended the agreement date of Cr. 137 far beyond the time when the GOA and the Territorial Administration (TA) had initially expected to be able to start assigning expenditures to the IDA project accounts. Synchronized schedules for developing the estate, the settlements, the mill and the transport facilities had been prepared in late 1967. The TA could not hold up any part of those activities, once the initial seedlings were planted, pending IDA signature. This was a popular and high priority project in Canberra and Port Moresby, and the TA was ready with GOA approval to shift funds from other budgets if necessary to complete the whole program if IDA support did not materialize. By the January 1969 starting date for phase one expenditures eligible for IDA disbursement, much of the heavy work (felling, access roads, village centers) was finished and some settler costs on the first two subdivisions had been incurred. IDA, prior to negotiations, had clearly ruled out retroactive finance, however, and was to maintain that position despite later attempts by the TA to have it relaxed, and despite evidence available to IDA shortly after the signing date that large savings from the \$1.5 million could be anticipated. Since the TA was "loathe" not to lose any of its new reserves of donor aid, it requested a one-year extension of the closing date, and IDA and TA collaborated in identifying additional investments related to phase one and eligible for IDA reimbursement (ultimately only 3% of Cr. 137 funds were cancelled). The point is that the investment items financed by IDA are not at all representative of project expenditures as a whole, neither in time nor by category. In fact the IDA funds in part formed an important pool for financing essential secondary investment and repairs, especially on roads. An illustrated chronology is attached to this report to help the reader visualize the time dimension of the various decisions and inputs (annex 4).

1.06 For IDA the definition of the smallholder project included settlement expenses and only those costs of the mill and other infrastructure and public services which were necessary for implementation of the settlement program. This PPAR, including its tables, keeps that definition, though the phrase "Smallholder Project" refers here to both phases.^{1/} The wharf is counted separately. In PNG the whole operation, including the nucleus estate, is often referred to as the West Nakanai oil palm scheme or the Hoskins oil palm project.^{2/} In the PPAR, the overall operation will be

^{1/} The Appraisal Report for Cr. 137 was entitled "New Britain Smallholder Development Project." The Appraisal Report for Cr. 175 referred to the oil palm components as the "Smallholder Oil Palm Sub-Project" and the "Kimbe Wharf Sub-Project".

^{2/} West Nakanai is the administrative census division in West New Britain District (now Province), and Hoskins is the district's principal town, 30 kilometers ENE of Kimbe on the coast.

referred to as the Hoskins Program, for that seems to be the popular term that has entered tribal language, and a distinction is made between that operational concept and the Smallholder Project.^{1/}

1.07 There are two important additional pieces of background information which put the Smallholder Project experience in perspective. First, the 12-year project implementation cycle, beginning in late 1967 when the TA prepared the original farm boundaries and started interviewing settler applicants, and ending around 1978 when the last of the approximately 1,600 settler farms will have reached the production stage, includes the period when the Territory as such passed into history, with self-government established in December 1973 and independence in September 1975. The Project was designed and executed by a cadre of relatively young, able Australian colonial officers in a flexible bureaucratic environment which allowed considerable freedom and control to the expatriate field agents at the project site. These conditions began to disappear in the early 1970s, with the Australian exodus and the strengthening of ministerial jurisdictions. The replicability of this administrative adventure along the same lines is impossible, though that does not preclude success along other, post-independence paths.

1.08 Second, one should consider the situation with world palm oil production and trade at the time of Project formulation. Production and export of oil extracted from both the pulpy palm fruit (principal use: foodstuff) and from the kernel inside the nut inside the fruit (principal uses: foodstuff and soap) had been increasing slowly in the previous decade, with South East Asia retaining the dominant trading position (Malaysia 33% of 1965-69 world exports, Indonesia 22%) while African countries were producing more but exporting less (Zaire 16%, Nigeria 9%). Table 1 provides summary figures.

1.09 In 1965 PNG produced no palm oil (except from some small experimental plots on New Britain developed in 1957 but largely neglected). It was known that stretches of the almost uninhabited plains on the northern coast of that island offered conditions ideal for oil palms, with gentle topography and deep, rich volcanic soils.^{2/} Some Malaysia-based experts guessed (correctly) that New Britain yields could surpass world records. Nevertheless, the most optimistic projections of total oil production which the TA could expect to obtain in the Hoskins Program at full development - and Hoskins was the only palm oil plan in an advanced state in 1965 - would not equal 1.0% of the world export total. Moreover, FELDA, the public

^{1/} The center of gravity of administration services for the program has shifted to Kimbe, and that geographic reference may be expected to dominate in the future. The map, anticipating such a development, refers to Kimbe rather than Hoskins.

^{2/} Soils too fertile to commit to rubber trees, which depend far more on water than nutrients to reach high yields.

land development and settlement authority in Malaysia, had already planted 27,000 acres of oil palms by 1965, and in the next decade would plant 421,000 more, figures to compare with 20,000 at Hoskins, including the estate. Thus although the Hoskins operation was important in PNG, it was not very significant by international standards.

1.10 Small size meant of course that Program production could not influence international prices. One of the extraordinary features of the Smallholder Project in its early years is that the accelerating flow in 1973 of settler deliveries of fresh fruit bunches (ffb) to the roadside for pick up and transport to the mill caught the rising tide of international prices and gave the phase one farmers and some of the phase two farmers temporary windfall profits that for better or worse they probably can neither repeat nor forget.

II. PREPARATION

2.01 The Territorial Administration began in 1960 to purchase land in the Hoskins area from local tribes for future forest and agricultural development. Several export crop projects were under consideration, usually involving resettlement of smallholders from three or four areas in the Territory where population pressures were considered a problem. Oil palm was a leading candidate, although government was also interested in cocoa, coconut, and rubber.

2.02 The earliest discussion in Bank documents of the PNG palm oil potential appears in the 1964 published report of the first IBRD economic survey of the Territory (November 1963 to January 1964). The report supported the TA's development strategy, emphasizing the need to promote new sources of foreign exchange and linking that to the virtually free land resources, in some of the islands, that could be exploited for the production of export crops. The report recommended that the TA encourage the establishment of two or three oil palm plantations in sparsely populated areas of New Britain or Bougainville, mentioning West Nakanai division of New Britain in particular. The mission's view, like the TA view, was that the oil palm projects should include nucleus estates associated with smallholder farms (blocks). It advised that trials precede settlement investments. Mission support for settlement was guarded - reserved to a few specific tree crop projects and generally discouraging of TA plans for massive relocation programs. But the GOA must have received a clear signal that the Bank would be favorably disposed toward a well prepared oil palm proposal.

2.03 The Hoskins Program design took shape within the next three years, with practically no Bank involvement. The Harrisons & Crosfield Group (HCG), which manages oil palm (and rubber, etc.) estates in Malaysia and Indonesia (and Ceylon, etc.), which is one of the foremost private companies in the world experienced in oil palm development and palm oil production, and which had strong associations with the GOA, was involved in the plans from the earliest stage. HCG collaborated with the territorial Department of Agricultural, Stock and Fisheries (DASF^{1/}) in field surveys in 1965, started plant trials in 1966 and submitted to the TA in the same year a proposal for the overall development program, including settlement. The proposal ("West Nakanai Agricultural Development Project") was forwarded to the Bank in October 1966.

2.04 The entrepreneurial and preparatory functions performed by HCG were crucial to the rapid evolution of the program. In spite of the apparent potential of the soil, and the fact that the technology of these tree plantings and of palm oil mills was relatively well known, the risks

^{1/} The designation DASF is used throughout the PPAR, though the name was changed in 1976 to the Department of Primary Industries.

of a pioneer oil palm venture on one of the last frontiers of the world were considerable. The uncertainties mostly involved human affairs - the performance of imported and unskilled laborers and settlers, the ever-present tribal frictions, the implications, for private foreign investments, of approaching self rule and independence, the lack of amenities and other incentives to retain managerial staff. Infrastructure would have to be created from scratch, and all equipment imported at high cost. But the proposal prepared by HCG and submitted to the Bank said that the possibilities for profit outweighed these risks. As a precaution, however, the initial venture was described strictly as a pilot project, with a tight limit on overall investments in the estate.

2.05 Internal Bank correspondence from that period shows the Bank was concerned about those dangers - about tribal prejudices, settlement issues, the continuing lack of trial results, etc. The October 1966 proposal was well received, but the project was thought not yet ready for appraisal. In any case the Bank looked forward to an updated assessment early in 1967, since a second IBRD economic mission was scheduled for March and one of the Bank's foremost agricultural consultants was on the team.

2.06 Such small delays were to have important consequences however. The project authorities were already moving ahead of the Bank. In February 1967 the TA signed a formal agreement with the HCG affiliate in Australia for the establishment of the nucleus plantation. The TA and HCG were to share equity ownership on a 50-50 basis of a new company, New Britain Palm Oil Development, Ltd. (NBPOD), for which HCG would serve as manager.^{1/} This was the standard HCG arrangement, though its equity contribution to the Hoskins Program was greater than usual. The area leased to NBPOD for 99 years for estate planting was large enough to provide the ffb to justify capacity planned for the mill at several stages of its expansion, though the immediate development plans called for more modest estate investments, thus allowing for smallholder deliveries, including a small share from local villagers who might be attracted to the oil palm enterprise. Ground was broken at the Mosa site in May 1967, the program was officially launched in July when the first seeds were planted, and the initial rudimentary elaboration of a network analysis - synchronizing the arrival of equipment, settlers and seeds with the factory, wharf and roads - was available later in that year. The audit could not determine to what extent the favorable attitude shown toward the proposal by the economic survey mission of March 1967 might have encouraged the TA to proceed with plans as rapidly as

^{1/} The Australian affiliate, Harrisons & Crosfield (ANZ) Pty, Ltd., served as manager. The PPAR will use HCG to refer collectively to Group headquarters in London, to the Australian affiliate, and to other affiliates. NBPOD was sole owner of two subsidiary firms, Mosa Plantation Pty, Ltd. and Mosa Oil Mill Pty, Ltd.

possible on the solid expectation that IDA funds would be available to help cover the early capital costs, or, conversely, whether the TA was confident it now had a worthwhile plan of modest total cost for which IDA support would be appreciated but was not essential and certainly not worth waiting for. The two impulses probably coexisted.

2.07 The oil palm proposal before the Bank was at the same time getting absorbed in a more ambitious scheme, developed by the Bank and its consultants, that meant further delay. The agricultural consultant on the March 1967 mission, with the support of the Bank's agricultural projects staff, converted the oil palm proposal into a subproject of a broader agricultural credit project, and tied the oil palm venture to development schemes in rubber, cocoa and livestock. Some of these had to be prepared from start and at high speed. The consultant was a livestock expert by profession, with little prior involvement in oil palm projects, but with very recent and apparently successful association in the Bank in developing multi-purpose agricultural credit schemes in other countries. The agricultural projects staff had collaborated on such institutional credit projects in Mexico, the Philippines, Costa Rica, etc., and was persuaded that the same strategy held advantages for PNG. The Bank was especially interested in the development of the new credit agency, the Papua New Guinea Development Bank (PNGDB). Moreover, by building up the size of the project portfolio to include livestock and other subsectors, one of the major disadvantages of the oil palm proposal would be eliminated, namely its small size. At the Bank, the administrative economies of a multi-purpose project were thought to be considerable. In July 1967 the same consultant returned to Canberra to help refine the larger proposal, which at that time called for an IDA credit of US\$8.4 million. He reported that the GOA looked forward to appraisal in CY 1967, a schedule which would have kept pace with developments at Hoskins.

2.08 The Bank could not keep that schedule. Appraisal took place in January 1968. The smallholder coconut component was eliminated during the mission and the smallholder rubber component was dropped a month later. Both were casualties of IDA's critical economic analysis. The livestock component took longer to bring to final appraisal stage than anticipated, again because of IDA's uncertainties over the economic justification of its original design. The oil palm analysis was extended too, partly because a key mission member was temporarily pulled off on another assignment. Also, there began to appear a series of correspondence, in the Bank's files, discussing the implications of a deterioration in world palm oil prices in 1968. Nevertheless recomputed rates of return still seemed to support the Hoskins venture. The yellow cover report was issued in June.

2.09 Negotiations, put off till August, were suspended in September because of IDA's financial predicament. At that time, as we have said, the oil palm proposal was rewritten as a separate project and it was signed in January 1969. Settlement related expenditures - by the Project Authority, the territorial Public Works Department, the GOA Works Authority,

the Land Board and other agencies operating at Kimbe -- during a period of approximately 15 months (late 1967 to early 1969) when the TA had originally hoped to receive IDA finance, were no longer eligible.

2.10 The rewritten appraisal report (ARI) was issued in December 1968. If the March 1967 economic mission had recommended the oil palm proposal for immediate appraisal as a separate project this slippage probably would not have occurred to anywhere near the same extent. The Project itself was hardly affected, since other funds were substituted for IDA funds and implementation proceeded without delay. But the fact that the Bank's intervention was in a sense displaced with respect to the main stream of Project activities suggests an element of avoidable diseconomy, as mentioned later. ARI estimated the total value of expenditures already made and proposed an IDA contribution of US\$1.5 million on the basis of a target share of 57% of expenditures subsequent to the date of agreement.^{1/} That value was about half of what the TA had requested in 1966, and, according to ARI, would amount to 45% of total project costs, including prior expenditures.

2.11 The problem of IDA delays is not a factor in the oil palm components of Cr. 175.^{2/} Just the reverse is true. Phase two of the settlement program was advanced by the TA to an earlier timetable after the initial success of phase one, and the Bank responded rapidly by broadening the terms of reference of the first Cr. 137 supervision mission in May 1969 to include appraisal of Cr. 175, and by expanding the original Cr. 175 draft package to include phase two. The credit was signed in January 1970, any expenditures made after June 1969 already having been declared eligible. IDA funds were thus available to help cover the costs of all of phase two expenditures.

1/ IDA agreed to disburse for expenditures incurred after that date, on work accomplished earlier.

2/ The rest of Cr. 175 ran into problems that led eventually to a two-year extension of the closing date: funds available in the coconut estate credit subproject did not attract any customers and the subproject was eliminated, and the IDA livestock disbursements began long after the TA had started activities (as in the oil palm case, the TA decided not to wait) and left large savings in that subproject's categories, both factors causing the TA and the Bank to look for suitable alternatives to avoid cancellation of any part of the US\$5.0 million credit. Most of the expenditures later added to the eligible list were incurred at Hoskins. These events suggest weaknesses in project preparation akin to those of Cr. 137, and point again to a possible Bank flaw in the scheme for packaging three (initially five) crop and livestock proposals in an omnibus project.

2.12 The Bank had intended to include in Cr. 175 for the Hoskins Program only the costs of a major bridge and the wharf, the pieces that carried over from the US\$6.0 million proposal of 1968. The implementation schedule in the field was such as to force the TA to proceed with bridge expenditures early in 1969, and it was dropped from the IDA package. But the Bank was able to accept expenditures on the wharf prior to signature of the second credit agreement, provided they occurred after July 1, 1969. By the time Cr. 175 was signed in January 1970 bidding, awards, and some initial works had already taken place.

2.13 One other preparation issue should be raised. The original October 1966 TA submission assigned part of the proposed IDA funds to support equity investment by TA in the palm oil mill. However, it was certain by then, or shortly thereafter, that HCG would install automatic hydraulic presses manufactured by Stork of Amsterdam, a company whose relationship with HCG was considered by some Bank staff to be too close. There were two objective criticisms of the arrangement. First, the Stork selection precluded international competitive bidding (ICB). This apparent departure from Bank rules did not alarm the appraisal mission in January 1968, since the mission confirmed to the satisfaction of at least some of its members that the Stork deal was the only fully integrated package available. That gave it significant advantages in areas like Hoskins, which lacked practically all service facilities. But the ICB objection was advanced later, supported by criticism on technical grounds. The Stork automatic hydraulic press was being challenged by the newer DeWecker (Luxembourg) screw press, which was gaining a reputation at that time as a more efficient instrument for extracting oil from the Tenera palm variety. The Tenera was a new hybrid which was rapidly replacing the older Dura parent (Tenera = Dura x Pisifera) on most oil palm acreage in South East Asia and was already being bred at HCG plantations in Malaysia for use at Hoskins. HCG switched to Tenera, and some observers feel now and felt then that it should have switched to the screw press as well. Stork did not make a screw press at the time. Other observers call that opinion unfair, and claim that in 1967/68 the advantage that the screw press has since demonstrated with Tenera, especially in countries where skilled labor is lacking and optimal operation of the automatic press is thereby jeopardized, was not at all clear and that the HCG/Stork deal made good sense. This was especially so, it is said, if one was trying to reduce the risk of investing on the frontier by sticking with machinery familiar to the managing agent.^{1/}

2.14 Whether the lack of ICB, or the growing doubts about Stork's competitiveness, dealt the decisive blow to IDA's intention to participate in the mill is immaterial to this history. The equity element was dropped from the proposed IDA eligibility list.^{2/} IDA effectively

^{1/} Nonetheless, these Stork hydraulic units were among the last to be installed anywhere in association with Bank funds.

^{2/} For HCG that was just as well. A delay pending IDA participation would have set back the proposed commissioning date by one to two years.

eliminated itself from a direct financial interest, and from leverage accruing thereto, on one of the components of the Hoskins Program that was crucial for the project success.

2.15 IDA was not unconcerned about the mill. In fact IDA tried to effect a direct agreement between IDA and NBPOD as part of the negotiation package. IDA also insisted that the TA guarantee that NBPOD would buy smallholder produce for the full 25-year life of the palm, instead of the 10-year guarantee period proposed by NBPOD. NBPOD refused to sign an agreement directly with IDA, whose participation offered no advantages to the company. So the agreement, spelling out responsibilities of NBPOD vis-a-vis the settlers (including the 25-year provision), was signed by TA and NBPOD as a condition of effectiveness of the credit (delays in reaching this agreement extended the effective date two months). To that extent the Bank kept the progress of the NBPOD mill within view of the Project. But responsibility for supervising this component in effect passed to the TA, which had no experience in palm oil enterprise. One must ask whether an equity contribution would have elicited more detailed surveillance by Bank supervision missions and, perhaps, more timely solution of the problems that were to beset the mill when it was swamped one year earlier than expected by the surge of estate and smallholder deliveries. As it was IDA did not review the mill plans before construction, and sent no engineer to Mosa till 1974.

III. GOALS AND DESIGN

3.01 The principal goal of the Hoskins Program was to "diversify and increase the production of crops for export ... so that, on Independence, the Territory would be in a better position to pay for the imports necessary for continued economic development" (ARI, page 2). In so doing, the Program would employ valuable but previously untapped resources: "there is an abundance of undeveloped and underdeveloped fertile agricultural land which can and should be economically exploited" (ARII, page i).

3.02 The objectives of the Smallholder Project, to the extent they can be discussed independently of the Program goals, were firstly to provide part of the labor force. HCG refused to invest alone in a single large plantation, requesting instead officially sponsored smallholder participation and the sort of government involvement, guarantee and protection implied therewith. In any case there was little surplus local village labor available, so substantial in-migration was inevitable. Secondly, the project was to provide an outlet for surplus labor in three small but densely populated parts of the Territory (see the map insert). This second objective of planned resettlement is given different weights, depending upon the source of information. ARI labels the project a "settlement" project, and lists four innovative policies with respect to settlement which the project was supposed to test in an effort to improve upon the poor record in PNG of earlier settlement schemes. In fact the TA has learned many lessons at Hoskins which have been transferred to other settlement projects. Two new, nucleus estate-smallholder oil palm proposals, for Popondetta (Papua) and Bialla (New Britain)^{1/} are both modeled closely after Hoskins. But ARI should not be interpreted to mean that the Project was ever looked upon in PNG as a solution to population pressure, or as a settlement activity for which the crop was merely an instrument of social change. The Project Authority was preoccupied with the production-cum-export objective, though naturally that forced it to be concerned with settlement stability. The Project Agreement signed in 1969 even called upon the TA to be prepared to substitute alternative labor for single settlers or groups of settlers should difficulties with them threaten the planting or harvesting schedules.

3.03 The Appraisal Reports are mute on equity issues. The few expatriate farms and ranches in PNG were not involved (in the oil palm venture^{2/}). The indigenous rural tribes and families were not differentiated for Project selection according to relative poverty levels in

1/ The Bank was involved in preparation of both schemes, and in October 1976 approved a Credit for Popondetta.

2/ The split of funds between indigenous smallholders and expatriate ranchers and plantationers was an issue, however, in the design of Cr. 175, especially after the smallholder rubber and coconut schemes were dropped. This left one smallholder and two expatriate components in the project.

order to concentrate on resettling the poorer units. The tribal economy is fairly homogenous and any effort to single out the especially deprived for settlement, other than on grounds of population density, would have been thought to invite disaster. To the contrary, the settler selection system gave priority to applicants showing evidence of enterprise and experience. In fact the Project has been criticized for unintentionally advancing a privileged class of farmers, now even richer than anticipated.

IV. IMPLEMENTATION

A. Physical Progress

4.01 The map shows the location of the seven settler subdivisions, the estate, the mill and the village blocks. The boundaries were determined by technical and ecological considerations and by uneven TA success in persuading local tribes to sell their land. The last subdivision settled, Kavugara, is 50 kilometers from the mill because the Project Authority ran out of suitable land in the immediate neighborhood of Kimbe before the settler population target was reached. Kavugara was the nearest section of suitable soil which was available for sale (IDA approved the jump to Kavugara in 1971). The phase one target was to place 580 families each on a 15 acre block in three years. The phase two target was to settle another 980 families in another three years (the schedule was later advanced, to overlap with the last year of phase one). Actual figures of families settled by November 1975 were 579 and 969. Another 43 blocks (3% of the total) had been allocated but not occupied. At full occupancy there will be 1,591 settlers, a total that exceeds the target by 31. The average age of the settlers at selection was 35.

4.02 Settlement schedules, and deadlines for acquisition or completion of inputs and infrastructure, were on the whole remarkably well met, given the isolation of the area and the condition of the Territory's young transport system.^{1/} The Project Authority often had to take extraordinary means to avoid implementation delays that threatened key target dates, dates firmly established on the critical path traced by palm growth. Some targets were met with little time to spare. The wharf, originally scheduled for completion in June 1971 when the first, small flow of ffb was expected, was not finished till February 1972: nevertheless docking facilities were ready to accept the first vessel in November 1971, or just about the time the Kimbe oil tanks were filling to capacity. Some of the ad hoc arrangements and adjustments made by the Project Authority bear no resemblance to elements in the original design. For example, NBPOD trucks have always been used to transport settler ffb to the mill because the settler cooperative trucking venture, which all agencies seem initially to

^{1/} Exceptions are mentioned in the PCR, but they serve more to show how many variables were out of control of the Project Authority and how bad the situation could have become. For example, the last phase of occupancy in Kavugara was scheduled for 1973/74 but postponed six months because the PA had run out of planting material, and this was because (1) Malaysia had suddenly stopped all seed exports in 1972, (2) the seeds imported from a substitute source in the Ivory Coast had proven to be 50% spoiled, and (3) the PA decided to switch altogether to local material being prepared at the neighboring Dami Oil Palm Research Station. This station had been developed by HCG from scratch starting in 1967, but without any intention of substituting for HCG Malaysia material so quickly.

have preferred, never materialized. The really serious timing problem - of matching the growing capacity of the mill with the unexpectedly rapid buildup of ffb deliveries - is as much or more a consequence of the success of the agricultural program than of bad planning by HCG. In any case the mill was not the responsibility of the Project Authority. The latter's performance seems exceptional. Tables 2 and 3 show the annual progress of settlement and plantings in the Project. The village schemes, which included 180 blocks by November 1975, are listed too. They had been pre-viewed in HCG's 1966 proposal, then excluded from the IDA project, but taken up subsequently as an additional obligation the Project Authority was able to assume.

4.03 The original design of the planting scheme was modified as experience dictated. The plan was to demarcate a 15 acre block in the rain forest to lease to each family for 99 years, fell without removal the trees on 6 of these acres (the whole site had already been logged for commercial lumber), and teach, persuade and coerce the settlers to do the rest. The rest consisted of: clearing, brushing and burning the under-growth on 3 of the acres, lining the brushed fields and planting the year-old seedlings (as best as possible among the remaining tree stumps and large fallen logs, all of which were left to rot), and maintaining the palms during their three years of immaturity and throughout the subsequent 25 years of the palm's expected commercial life. The settler was pledged to fell, clear and plant 3 additional acres the second year and 2 the third year, ultimately to reach a total of 8 producing acres. He had other jobs upon arrival - in particular clearing an additional 2 acres for subsistence crops and constructing his house, using tools supplied.

4.04 By 1975 the original design had been altered in several ways, including: the original three-year development plan was reduced within the first 12 months of operation to a two-year development plan of 4 acres each;^{1/} after 1970 houses were constructed by contract on a site selected by the settler and using his services as an unskilled laborer (the family arrived after the house was built); the 8 acre palm plantation was expanded to 10 acres, with the same number of trees (480) but greater spacing (to allow for the prolific leaf growth); and all 10 acres were felled by labor gangs before the settlers' arrival and planted in the first year of his residence. These adjustments are incorporated in plans for the newer oil palm schemes which are also based on 15 acre (6 ha) blocks.

4.05 Table 2 shows that by November 1975 a total of 13,700 acres had been planted by 1,548 settled smallholders, one-third of the total under phase one (Cr. 137) and two-thirds under phase two (Cr. 175). Another

^{1/} The plan was again changed, on the Kavugara subdivision in 1972 and other more recent allocations of blocks, to a one-year program.

1,300 acres were planted on 180 village blocks, and 6,200 were planted on the Mosa estate. At full development (up to the 8 or 10 acre ceilings) the smallholder settler plantations will total a little over 14,000 acres (HCG by comparison, manages 60,000 acres of estate oil palm in Peninsular Malaysia; the Jengka Triangle in Peninsular Malaysia includes 65,000 acres of smallholder oil palm; the Popondetta proposal calls for 14,000 acres of smallholder oil palm). The average phase one farmer is also cultivating about one acre of his planned two acre subsistence food plot.

B. Institutional Arrangements

4.06 Institutional arrangements worked well throughout the main period of site development, resettlement and planting. The first government officers in the field represented the land adjudication authority and the Public Works Department. By 1967, however, the center of gravity shifted to the Project Authority. This unit, staffed in the field mainly by DASF officers, usually counted on the cooperation of other agencies at the site to help tackle the series of jobs and problems. If other agency staff were not available at Kimbe, the DASF had to make do in unfamiliar professions. Where other agency services were felt to be inadequate, or delayed, the Project Authority took over the assignment. This was the case with the upkeep of sub-divisional roads, which was absorbed by the Authority in 1970.

4.07 A special administrative arrangement placed an overall project director, the Project Coordinator, Headquarters (HQ), in Port Moresby to ensure adequate support from the central offices of the several agencies, and a field director, the Project Coordinator (Field), at Kimbe to synchronize the separate jobs and manage settlement and agricultural activities. The Project Coordinator (HQ) enjoyed the full support of the Assistant Administrator for Economic Affairs (of the Territorial Administration). This arrangement and support survived long enough to get the bulk of the development work done. The Project Coordinator (HQ)'s power was weakened when the Assistant Administrator's position was abolished in 1973, one of the inevitable consequences of self-government. In fact the Project Coordinator (HQ) position itself disappeared for a year. Senior Project Authority staff at Kimbe at the time of the audit mission believed that the gradual erosion of their unit's influence over the activities of other agencies - road repair by the Public Works Department, settler selection by the Land Board, etc. - and indeed even over budget allocations by the DASF, which is responsible for project finance (and, as mentioned, is the source of most of the seconded project professional staff) - constituted the greatest single threat to efficient conclusion of residual elements of the Smallholder Project and implementation of successor settlement projects. Since principal officers of all the agencies, either in Port Moresby, Kimbe or Rabaul (the administrative center for New Britain), were expatriates in the early years, and since the "old boy" relationship allowed pragmatic implementation decisions to be effected with a minimum of bureaucratic constraint, sometimes in unorthodox if not unauthorized manner, one must conclude that the managerial experience could not be reproduced.

C. Settler Debt

4.08 The cost of the settler's airfare to New Britain, of felling, seeds, tools, etc., and of a house without electricity or piped water, were lumped together in a debt, initially set at US\$2,230 per settler, though rising with inflation to US\$3,260 in 1975. Repayments were to be collected by NBPOD on behalf of the PNG Development Bank by deduction of up to 50% of cash earnings during the first nine years of production. The charge included interest payments at 6% per year (later increased to 8%), capitalized during the pre-production period. The composition of the debt is shown in table 4. The charge did not include the costs of infrastructure - roads, villages, etc. - which were provided by the TA, or the costs of services provided by all official agencies. In fact the government provided or promoted a broad range of community services, including settler self-government institutions. Each subdivision contained a village site (within walking distance of each block) where the basic amenities of an administration building, primary school, medical post, small shops and a community center were provided.

4.09 Project monies were lent by the TA to PNGDB (including US\$0.6 of Cr. 137 funds and US\$1.4 million of Cr. 175 funds), to reimburse the Project Authority and other government agencies for expenses incurred on behalf of individual settlers. These transfers were debited to the settler's loan account. The money was lent to PNGDB at 1-1/4% interest, repayable to government in 25 years. GOA persuaded a reluctant IDA to accept these terms in order to use the projects to support the overall development of PNGDB, since they offered PNGDB a spread of at least 4-3/4% (6%-1-1/4%) and the possibility to roll over the settler repayments to new agricultural loans.

4.10 Nevertheless, the PNG Development Bank's field role in the Smallholder Project was relatively small,^{1/} since (1) between 75% and 80% of the settler's loan was disbursed in kind or as services by the Project Authority, (2) the rest was handed out in cash as subsistence and living allowance, also by the Authority, and (3) all of it was collected by NBPOD. The settler portfolio comprised only 12% of the total value of the PNGDB's 1974 loan portfolio, and 16% of all of PNGDB's clients. PNGDB did not place a permanent representative in its Kimbe office to deal with settler affairs until September 1972, a year after the first payments to settlers were made by NBPOD. The delay in assigning resident staff, and the lack of direct contact with the settlers, have provoked some criticism. PNGDB argues now that it was a mistake not to have representatives in the field from the beginning. But the system was working well enough without further involvement, and the young bank, which began operations in July 1967, was able to concentrate scarce staff on other projects: on problem projects or on those in which debt collection had to be handled directly.

^{1/} PNGDB also made a loan of A\$2.5 million to NBPOD to help finance its expansion program in 1971. This is PNGDB's largest loan.

4.11 That convenience was not enjoyed without certain losses, however. Most of the early groups of settlers missed a personal and continuing relationship with the official credit agency, one of the implicit objectives of the Bank's agricultural staff when it reformulated the TA's 1966 project proposal as a multi-purpose agricultural credit scheme. By August 1975 87% of the phase one settlers, who enjoyed the high palm oil prices of 1974, had paid off their entire debt. Repayment had taken them four years from first harvest. ARI had assumed it would take seven years starting two years after first harvest. These ex-debtors probably never had enough contact with their creditors to distinguish PNGDB staff from DASF staff. This comment refers mostly to the earliest settlers, and should not be taken to mean that PNGDB has been indifferent to the Kimbe settlements. In fact PNGDB has maintained continual surveillance of Project progress, and senior PNGDB staff are fully up to date on agronomic as well as financial developments.

D. Project Costs

4.12 Project costs are summarized in table 5. The figures include estimates by the Project Authority and OED of the share of NBPOD's capital costs - for example on the mill - reflecting capacity creation to handle smallholder production. Total costs of the Smallholder Project, phases one and two,^{1/} were approximately US\$8.7 million, of which IDA financed US\$4.2 million, or 48%. The share is slightly higher than that forecast in ARI (45%), but the tabled list of costs is not complete. (Most of the local costs of extension and other services were omitted from the appraisal tables and from subsequent reports, for reasons that are not clear. Also, management functions provided by NBPOD are excluded.) Savings were realized in two categories: in cash living allowances of US\$8 paid per month per family throughout the pre-production period (raised to US\$10 in 1975), because production started half a year earlier than expected; and in "removal" expenses - the costs of transporting settlers to Kimbe. Major cost overruns are reported in five categories, listed next in decreasing order of importance: the mill, PNGDB services, Project Authority extension and other agriculture services (mostly in the earlier years), roads and houses. Much of these overruns is explained by inflation, though the mill and road categories reflect additional upgrading that had not been anticipated. The actual total shown in table 5 is 9% higher than the combined appraisal figure (A\$7,227,000, vs A\$6,618,000^{2/}). The cost escalation is thus relatively modest, given the inflationary trend in the period.

1/ Excluding the wharf.

2/ The A\$6,618,000 figure excludes A\$202,000 estimated for capitalized interest in ARI and includes A\$300,000 estimated by OED for NBPOD in phase two.

E. Delays

4.13 Implementation delays of different length can be described, depending upon whether attention is focused on IDA disbursements, settlement, or palm oil processing.

4.14 As mentioned earlier, the closing dates for Cr. 137 and Cr. 175 were extended, by 12 months (21% of the length of the period originally planned between effectiveness and closing) and 24 months (48%) respectively. The purpose of the delays was to include a longer interval of project expenditures eligible for IDA disbursement, with the aim of avoiding cancellation of any part of either Credit. These "delays" do not have much relationship to the Smallholder Project itself, wherein settlement was implemented more or less on schedule. Annual IDA disbursements are shown in table 6. The recent shift of the last batch of Cr. 175 funds to road investments is illustrated by table 7.

4.15 The biggest physical bottleneck developed at the mill, where, once ffb deliveries commenced, expanding capacity took five years (1971-1975) to catch up with expanding production. The mill foundation had been built big enough to support equipment with a capacity of around 50 tons ffb per hour, but the first line of two Stork hydraulic presses was expected to have to cope with only 10 tons ffb in 1971/72. Apparently the first line did a good job in handling the initial year's production. But it could not keep up with the accelerating deliveries, and signs of strain proliferated. The concept of a "pilot project" had to be abandoned altogether. The plant expansion program was accelerated, and this in the face of continuing shipping bottlenecks which became increasingly costly as NBPOD struggled to add the second line. The capacity problem was aggravated by the inevitable failures of the start-up period and the deficiencies of the automatic press, for all of which NBPOD needed repair time that was not available. NBPOD feels that the shortages of skilled indigenous and expatriate personnel, including contractor staff, provides an equally important explanation. The capacity lag was so bad in 1974 that in one period NBPOD let half of the estate harvest rot in order to absorb the smallholder production. This act of enlightened management was not demanded of the company by any of the legal stipulations, but was reckoned by NBPOD, with agreement from the Project Authority, to be essential to its harmonious relationship with the settlers. The second processing line with two Stork screw presses was finally completed in December 1975 (18 months behind schedule), raising the mill's capacity to 40 tons of ffb per hour, a rate considered sufficient to handle present production. NBPOD had added a third press - a screw press - to the first line in 1973 and converted one of the other presses on the first line in 1975. These changes, together with improvements in the operation of the mill, will ultimately bring the mill up to 50 tons capacity.

F. Other Problems

4.16 A number of other problems have emerged during the implementation period to cause the Project Authority and/or the Bank's supervision missions concern. These include:

- (1) Transportation of smallholder ffb. Plans to create a transport cooperative or company independent of NBPOD have failed to materialize despite heavy promotion by the Project Authority. NBPOD has always provided trucks and drivers. It had hoped to avoid assuming this role, but, because an efficient transport system is essential to an oil palm operation, NBPOD has reluctantly come to the conclusion that it must now manage the system. Tribal suspicions explain part of the difficulty of establishing a coop. NBPOD's transport services have themselves not always operated at full efficiency.
- (2) Pollination. HCG and the Bank had anticipated that the palms would have to be hand pollinated only for the first six years. However, the unsuited conditions of wind and carrier insects at Hoskins indicate that hand pollination may have to be performed throughout the life of the tree. Inconsistent and varying skills for pollination among smallholders explain much of the variability in their yields, and the fact that average smallholder yields are expected to reach only 75%-80% of estate yields. Skills will improve, but the ease of operation will diminish as the palms grow taller.
- (3) Records, reports and requests for disbursements. The reporting system is now adequate for Bank needs, except perhaps in the presentation of full project costs, but that was not the case throughout most of the life of the two IDA credits. A long gap between the submission of progress reports from September 1969 to June 1973 was tolerated at first by the Bank and then the source of increasing supervision pressure and hard language. Part of the problem is explained by three factors for which the Project Authority was not responsible: (a) communications with IDA had to be passed through Canberra until 1970; (b) IDA's requests for records of expenditures and project progress referred to the IDA project period, and it was not easy for the Project Authority to accommodate its overall accounts - processed routinely since 1968 - to the offset IDA accounting period (this was also a source of delay in the Treasury, which had to sort out items eligible for IDA disbursement); and (c) the Kimbe staff were not properly alerted in advance to

the IDA reporting requirements (the Cr. 137 GOA negotiating team included no one from the TA, let alone from Kimbe) and were only made fully aware of IDA's insistence on this point when the 1971 supervision mission slammed the Authority for its tardiness. But the essence of the early reporting problem is that the Authority staff was too busy on development work, and the lack of reports was not then, or not then thought to be, critical. The problem persisted longer than it should have partly because of the loss of expatriate staff and some mix-up in assignments and even addresses (an interest payment due to IDA on Cr. 175 was lost in a New York City bank for several months in late 1973).

- (4) Settler selection. Roughly 10% of the original selection is now considered to have been poorly made. Another 10% of the selected settlers never showed up, though the reasons in most cases are thought to be unrelated to the method of selection used. The experience of DASF and PNGDB staffs led to the identification of qualities which tend to contribute to poor settler performance, and criteria were revised to reduce this ratio in later selections (see annex 2). The latest proposal is to adopt a points system similar to that used in Malaysia, a plan originally rejected by the Lands Department as an infringement of their prerogative. Relations between that Department and the Project Authority were not always harmonious. Comparisons with and copying from Malaysia on this matter are in any case dangerous, since PNGDB has no counterpart to the Malaysian system of card and fingerprint identification of all nationals over 12 years of age. PNGDB considers that the early selection system was the cause of some of the greatest difficulties at Hoskins. DASF agrees there is room for improvement, but feels that given the absence of personal records, the multiplicity of names, the frequent substitution of identity, etc. the selection system worked reasonably well.
- (5) Forfeiture. Roughly 10% of the first several groups of settlers in phases one and two never took possession of their blocks, and another 5% arrived but have proven unable or unwilling to develop and maintain the plantings. Legal obstacles prevented the expeditious transfer of leases to new applicants, especially where forfeiture and repossession was involved. IDA supervision missions noted the large number of vacant blocks and, with the urgings of the Project Authority, maintained pressure on the TA in Port Moresby to eliminate the obstacles. The first foreclosure action was threatened in 1970, but did not have to be taken. Settlers seem to respond well to warnings, and to the few examples of forfeiture which have since been carried out.

G. Kimbe Wharf

4.17 The wharf presented no serious problems. The job was tendered in two successive phases, for the steel pilings and for the wharf, each calling for international competitive bidding. Bids were received and construction on both begun before Cr. 175 was signed in January 1970. The tender, the bids and the final selection for the wharf contract were all reviewed in Washington during 1969. The contract was let to Hornebrook Pty. of Australia in December 1969. A UNDP sponsored transport study team visited PNG in 1969, and, after a quick visit to Kimbe, suggested a few modifications in wharf design which were incorporated. The wharf, with 370 feet of berthing length at the end of a 400 feet jetty, was to be completed by June 1971, according to the contract, for a total cost of US\$900,000. It was actually completed in February 1972, for a total cost of US\$910,000, though freighters could dock at the facility beginning November 1971. NBPOD financed the oil tank farm, adjacent to the wharf. No IDA funds were used to finance the costs of the all weather road between Kimbe (the tanks) and Mosa (the mill) or of the bridge over the Dagi River.

V. PROJECT IMPACT AND RETURNS

5.01 Settlers in each of the five subdivisions which had reached production by 1975 have been able to start harvesting the fresh fruit bunches within 2-1/2 years of planting, that is, when the plant was 3-1/2 years old. ARI forecast that harvesting would start 1/2 year later. A gradual buildup of yields also had been forecast, based on experience elsewhere, but the harvests at Hoskins yielded well almost from the beginning, evidence of the excellent natural fertility of the soils. Together the two factors have put the volume of deliveries by the settlers (and the estate) about a year ahead of schedule.^{1/} The maximum yield itself, whether measured at the Dami Research Station, the estate, or on the better smallholder blocks, appears to equal or exceed records established by plantations in other countries. ARI had estimated average smallholder peak yields of 9 tons ffb per acre, per year, by the fifth year of production, declining slightly and levelling off at 8.5 tons thereafter until just before the tree had to be cut down at age 25 (palm trees are felled when they grow too tall for the fruit bunches to be harvested). The Project Authority now estimates average yields of 8.3 tons, as early as the first year of production and lasting to age 23 (the trees are growing faster than expected). The figure is about 75% of the estate average. The best of the smallholders get 11 tons, comparable to or slightly higher than the estate average. The worst smallholders are averaging 3 tons, though it is highly likely that the clear comparison with the better farmers will persuade some of the poor performers to improve, or to give way to more industrious family members or even sell out. NBPOD, which needs as accurate a forecast of average smallholder yields as possible to plan the disposition of mill capacity, uses the 8.3 ton figure. Agronomists from HCG headquarters in London participated in the calculation.^{2/}

5.02 Question marks hover over long term projections because it is not clear whether, on the one hand, the smallholders will maintain their blocks and especially their pollination standards over a sustained period after building up comparatively large cash savings in the first 10 years, or, on the other hand, the high yield levels will depend upon rates of fertilization which cannot be justified on financial or economic terms. HCG experts feel that the depletion of fertility levels is not an immediate problem and that fertilization of smallholder blocks at this time is not worth its costs. That is not a unanimous position, however, and much of the research conducted at the Dami Station is directed toward fertility and nutrient studies.

^{1/} See table 9.

^{2/} The estimate refers to the 8 acre holding, with the high density spacing. Based on the satisfactory performance at Hoskins, the proposal for the smallholder project at Popondetta assumes peak smallholder yields in Papua of 8.1 tons, levelling off at 7.5 tons, figures 80% of the Popondetta estate forecasts.

5.03 Palm oil production and export values, the key indicators for the overall project goal, depend not only on harvest yields but also on the oil extraction rates from fruit and kernel and the free fatty acid content of the oils. These parameters are in large part a function of the efficiency of the mill and weather conditions, and to that extent beyond the settler's control. Results have been below expectations. Problems at the mill, and an unexpectedly strong cyclical response of the palm to wet season conditions in New Britain^{1/} account for most of the shortfall in extraction rates, though NGPOD argues as well that original expectations were too high. The excessive interval between harvests — a result of the mill capacity problem, failure of some settlers to comply with harvesting instructions, and inefficiencies in the transport system — is a contributing cause of excessive acid content. Until recently pick-up rounds averaged 18-24 days, twice as long as the optimal round (10 days). NBPOD expects that these shortfalls can be and are being eliminated. Data presented in the most recent progress and supervision reports support that view.

5.04 Table 8 gives several estimates for each of the principal productivity parameters, including the appraisal forecasts and some more recent forecasts and actuals. Table 9 shows production data to 1974/75. If the recent forecasts of table 8 are correct, the volume of production and export of smallholder palm oil from Kimbe will exceed by some 10% appraisal forecasts for the decade 1971-1980. The excess is due to the early deliveries (but is lower than it would have been if the mill extraction rate had reached expected levels). The Project, in particular the efficient and timely execution of the resettlement and planting operation, and the settlers' performance in clearing, planting, maintenance and production, is clearly a success. It would have been a success regardless of the high palm oil prices received in 1971, or of the spectacular resurgence of prices in late 1973.

5.05 Figure 1 shows the level of the price of palm oil CIF Europe during the last 15 years, and figure 2 shows the level of the NBPOD price paid to the settler during the last five years. The level forecast at appraisal also appears. Those forecasts now seem conservative, though they did not seem so to the Bank staff in 1968 (para 7.15). The windfall profits accruing to the phase one settlers due to the high farm gate prices of July 1973-December 1974 automatically resulted in premature pay off of their debts to PNGDB. By January 1976, most of the phase one settlers were fully repaid, some of them seven years ahead of schedule. The profits and the pay off add additional luster to the image of success of the project. Phase two settlers in the Buvussi and Galai subdivisions participated in this sudden wealth.

5.06 Phase two settlers in the last two subdivisions occupied, Kavui and Kavugara, started production in 1975, not only missing the high prices but suffering the unusually low returns at the end of that year. Complaints

^{1/} See the footnotes to paragraph 7.04 and table 8.

were received with increasing frequency by Project and NBPOD staff about the low prices in late 1975, as one might imagine following the previous year's record and the phenomenal collapse in early 1975. An extraordinary educational effort has been required to teach the illiterate settlers the elements of international price cycles and the fairness of the formula used by NBPOD to derive the farm gate ffb price from the CIF Europe oil price (the formula has to be approved by the Project Authority and IDA). The effort has met with mixed success. Rumors of settler strikes were spreading at the time of the audit mission to PNG in November 1975, but the Project Authority believed that the disturbance would be temporary and in any case did not affect the majority of smallholders. There will be an upward drift in the farm gate price anyway, as the mill and transport systems become more efficient and those charges in the formula are reduced. Moreover, the Bank's new forecasts of palm oil export prices measured in constant dollars are above the lowest 1975 values and the projected farm gate price is at least double the lowest price paid in 1975. Nevertheless, the fact that the low prices persisted in 1976 gives sufficient warning of the inescapable hazards of this sort of enterprise.

5.07 Updated estimates of net earnings for the average settler's enterprise are all above appraisal estimates. ARI (December 1968) estimated annual income at full production, and after loans are fully paid, at US\$900. ARII (December 1969) lowered the figure slightly to US\$830. The Project Authority estimates US\$1,900 at present, the same figure shown in the Popondetta proposals. It corresponds to US\$1,300 at 1968 PNG prices. Neither appraisal report presented financial rates of return to investments on the average block, though an internal Bank memo from that period gave a figure of 14% (excluding imputed family labor costs). The Popondetta Appraisal Report gives financial rates of return between 30% and 40% (excluding family labor). It would seem that most of the phase one settlers at Hoskins will have done better than this, given the impact of the early period of high prices on their income streams. The PCR for Cr. 137 gives an estimate of 38.1% for the return to the average settler who arrived in 1968/69 (again, excluding family labor).

5.08 The updated estimate of the economic rate of return to the Smallholder Project is also likely to be above appraisal estimates. ARI calculated 9%; ARII, prepared a year later, calculated 20% to phase two investments and 15% to phases one and two strung together. These figures refer to the Hoskins Program as a whole. Neither report attempted to isolate the economic returns to the Smallholder Project. Rough calculations by OED summarized in table 10 suggest that returns to the project will be about 19%. The last calculation is not as meaningful as the estimate for total Program costs, since estate, mill and settlement decisions are interdependent. But cost figures for the estate component, and for the other physical infrastructure, are not available. In any case the returns are impressive. The impact of the high prices in 1974 explains only a small part of this success, as shown in table 10 (run 2).

5.09 Sensitivity analysis shows how the rate of return estimates for the Smallholder Project relate to the long run price of palm oil. The Bank now projects the CIF Europe price per ton at US\$400 (figure 1). That price would have to be cut in half before the economic rate of return passed below 10%, all other variable values held constant. The settler is protected to some degree, because the revised formula for withholding from his gross income for debt repayment now provides that the withholding cannot cause his monthly earning to fall below a certain floor (in September 1975 the floor was US\$7 per ton FFB). If that low level were to persist for decades, the Smallholder Project would still earn an economic rate of return of 12% (compare with the 19% given in the last paragraph). The settler would not be making debt repayments at that low farm gate price level, however, so that a financial loss would be absorbed by the PNGDB. These speculations demonstrate the extent to which Project success in early years has guaranteed reasonably attractive overall rates of return regardless of future swings in international prices, though continuing low prices in future years will undoubtedly upset settlement stability and violent swings in prices may have the same effect in the absence of the creation of some form of stabilization fund, about which there has apparently been either little discussion or little sign of government support. One other obvious threat to the Project would be devastation by pests and disease. HCG and other major palm oil producers are convinced that that factor, should it erupt,^{1/} can be controlled.

5.10 These benefit calculations ignore the incalculable effects to the surrounding village population, and to PNG, of the rapid development of Kimbe township, the commercial and banking services that have grown up there, and the full range of rural services the villagers have begun to enjoy, all as a consequence of the Hoskins Program. Largely reflecting the growth of Kimbe, the population of West New Britain district has increased by 25% over the past four years, to an estimated 75,800 in 1975. With the ability to accept overseas cargo vessels, the Kimbe area has now the advantage of considerable freight savings. One of the effects of this has been an increase in smallholder coconut production in the area from 300 to 3,000 tons of copra per annum, a result of the creation of a ready outlet for direct export. The Dagi coconut settlement area adjoining the estate was rejuvenated in the process (map).

^{1/} As the area planted to oil palm increases in PNG, the incidence of pest and disease is expected to grow.

VI. SPECIAL ISSUES

6.01 Ten issues are given separate attention below, most of which were selected because they arise in other Bank supported tree-crop settlement schemes, and it is useful to develop a basis for comparison. Other issues that have not been pursued in this report include: the relationship between the commercial logging operation and the settlement operation which followed it, including road location and standards, the logging timetable, lumber selection, etc. (most of the logging was finished before the Project Authority took charge); the sources and content of technical assistance to the settlers, in which the Project Authority played the dominant role,^{1/} but with the support of the Dami Research Station and some estate staff, and occasional overseas visitors representing HCG;^{2/} and the emphasis and strategy for localization of positions otherwise occupied by expatriates. The last is a management issue which the Project Authority and NBPOD appear to have approached from different directions, with the Project Authority now said to have trained too few too late and the NBPOD suffering from having appointed locals immediately to critical technical jobs in the mill, assuming they would benefit from rapid in-service training - and later having to bring in more foreigners to reduce the number of stoppages.

A. Settlement Stability

6.02 All evidence suggests that as long as farm gate prices remain reasonably attractive, the settlers will stay at Hoskins, and maintain the palm trees at fairly high standards. The economic incentives were high enough to have overcome the initial divisive forces that concerned the GOA, TA and the Bank in the late 1960s - loneliness, climate, tribal fighting, etc. The fact that the settlers had to be kept busy for 2-1/2 years prior to any production was a source of concern, but that concern evaporated when the first harvest came early and heavy.

6.03 There is no assurance that individual proprietors will stay. Brothers, cousins and sons may take over. Tribal institutions are such that revolving membership may become commonplace: family relations frequently show up for indefinite periods, and usually remain without work. But it appears certain that the vast majority of the blocks will stay in the family and be continually farmed. The rules do not forbid one settler ultimately buying out another, and increasing his farm size. In that way the poor settler performers may be squeezed out. But the settlers have a residential clause in the lease covenant that says they must remain resident for seven years, unless they have paid off their lease. If they want to sell their block, and have not paid off their lease, they must gain permission for the sale from the PNGDB, which holds the mortgage. Since tribal

^{1/} The average number of officers on each subdivision during the development period was five: one ADO (expatriate), one AADO and three AAs (nationals). Assuming there were 230 settlers per subdivision, the extension "intensity" can be roughly calculated at 50 settlers per agent.

^{2/} Harrisons Fleming Advisory Services Ltd., the technical advisory subsidiary of HCG, makes an annual inspection of settler and village progress under a contract with the Project Authority signed in 1973.

attachment to land is so powerful in PNG, it is unlikely that many transactions with complete strangers will occur even after seven years have elapsed. Two hypothetical indicators of stability, both of which have been used elsewhere to suggest that settlers do not intend to stay, are invalid at Hoskins. Firstly, few of the settlers have improved yet upon the standard design of their simple wood houses (as many Malaysian settlers have done), although such changes, including complete rebuilding to larger standards, are now beginning to appear. The audit mission was told that most PNG tribesmen do not appreciate such elaboration and that the group that does the most, from East New Britain, also has the highest delinquency rates. Secondly, the settlers have not expanded their oil palm plantations onto the extra 5 acres in their block. But they are not allowed to because of capacity considerations at the mill, and the original design did not propose such an expansion.

B. Secondary Jobs

6.04 The Project Authority has not made any significant effort to lay the foundation for the creation of supplementary employment opportunities in the Hoskins area, opportunities that could reduce the growing number of leisure hours available to the settlers. Given that the staff was completely absorbed with the tasks of settlement and production, given that NBPOD has tried, with little success, to attract surplus male and female labor from the settlement subdivisions to work on the estate, and given that more "rewarding" opportunities are difficult to invent, find or create in such an isolated setting, lack of progress is not surprising. Many of the settler sons, all of whom are being educated at primary schools in the subdivision villages, will be looking for white collar jobs or their own enterprise. The mechanism for alleviating part of this problem already exists, since land has been set aside in the villages for proprietorial shops (the otherwise ubiquitous "Chinese" shopkeeper and other traders are not allowed to occupy this space). But few such shops have been opened, and until recently, the Project Authority had not gone out of its way to foster this activity. Settlers buy most of the few provisions they need at the trade stores in the older villages. The Project Authority is now looking at the possibilities for secondary industries, and hopes to see a proliferation in the numbers of other retail ventures such as service stations, repair shops, eating parlors, etc. Nevertheless, the secondary job market will remain a problem, one of the "second generation" problems at Hoskins, because the producing 8 and 10 acre farms cannot keep more than one adult busy the whole week. It is possible that the best secondary point of attack is the extra 5 acres on each block, most of which is still in bush but suitable for other cash crops. The Project Authority reports increasing interest being shown by the settlers for expansion of commercial cropping, including new plantings of cocoa, chillies, peanuts, and vegetables (and some pig and poultry ventures). If expansion of oil palm acreage were permitted, many settlers would be expected to do so.

C. Consumption

6.05 The Hoskins subdivisions lack the visible signs of rising consumption standards that one would expect with high settler incomes and that are the pride of settlement officers in Malaysia. There are few cars, few motorcycles, and few household extensions, though the numbers of these and other material possessions are gradually increasing. The local shops are stocked with tins of tuna and bully beef and candles, but bare of leisure goods. Local tradesmen talk of money disappearing. Project officers say the earnings are being carried to the tribal areas,^{1/} though the audit mission asked Australian National University research staff in Chimbu District in the New Guinea highlands about these cash flows and were told they were not so large yet to be detected in local accounts. Commercial banks with offices in Kimbe and Hoskins are attracting some of the earnings into savings deposits,^{2/} but the total is still small. In fact institutional records show a substantial inflow of funds into Hoskins that cannot be accounted for. Some of the funds are known to be buried in the ground, a popular security measure. The point to make is not that the cash is disappearing (though that subject deserves further research) but that a consumer market of substantial proportions remains to be tapped, once settler consumption preferences have been better understood.

D. Tribal Origins and Disputes

6.06 Table 11 shows the breakdown of phase one settlers by tribal origin. The map insert locates the three small regions in PNG which provided 85% of the total: Chimbu District in the Eastern Highlands (New Guinea), the lower Sepick Valley (New Guinea), and the Tolai farmlands on the Gazelle Peninsula south of Rabaul (New Britain). These were the groups the government in the mid 1960s had targeted for relocation, and in this sense it achieved its purpose. A majority of the settlers had had some previous experience outside subsistence agriculture, and are thus distinguished from the average tribesman. But the settlers, even those few (the Project Authority estimates 15%) who were interviewed for selection in Port Moresby, Madang or other urban centers, are all of rural origin, possessing little material wealth (though some may have had prestigious positions in tribal affairs), and share traditional partisan tribal attitudes. These Chimbu, Sepick and Tolai tribesmen were brought together at Hoskins.

6.07 The Project Authority tried to design the layout of the subdivisions so as to minimize the possibilities for tribal fights while maximizing the opportunities for intertribal cooperation. The location of the home within each block, as related to other homes, became an

^{1/} The outflow was apparently spectacular in 1974, when settlers boarded planes at Hoskins with suitcases full of cash.

^{2/} PNGDB does not run savings accounts.

instrument of social engineering. One scheme, of several that were tried, clustered homes of four members of the same tribe at the common corner of a four block square, alternating tribes on neighboring squares. The whole effort seems to have worked well. There have been major fights, in the labor quarters on the estate as well as in the settlements. One of the biggest, in 1973, pitted New Guinean settlers and laborers against Tolai settlers. Killings have occurred, and at one point in 1971 NBPOD dismissed almost its entire estate labor force, then composed of individuals recruited exclusively in the highlands, following a fight with company supervisors of West New Britain origin. A fight between laborers was in progress on the estate at the time of the audit interview at the Mosa mill. Nevertheless, given the historical record of tribal warfare in PNG, the disputes have not been anywhere near as destructive to the Project as they could have been, or as some persons predicted in 1967. And there has been little physical conflict between surrounding villagers and settlers or laborers. The Project Authority, in effect, has kept control, though sometimes only by quick and heavy-handed measures by expatriate officers. The problems are reported to be subsiding, partly because of the relationships developing among the younger generations at the schools.

E. Self-Help

6.08 . In Malaysia, where Bank participation in the FELDA settlement schemes preceded its involvement in PNG by a year, and which therefore provided patterns against which the Hoskins proposals could be assessed, many of the jobs left to the settler at Hoskins were done by FELDA for him. Eight discrete jobs can be identified in the process of bringing tropical rain forest up to the point of a producing oil palm plantation: (1) commercial logging, (2) felling ("pre-clearing") of remaining timber (the felled trees are left to rot), (3) clearing of underbrush, including stacking and burning, (4) planting the cover crop, for erosion control and other purposes, (5) lining, (6) holing, (7) planting palm seedlings, and (8) routine maintenance of the palm rows while the trees mature. FELDA settlers were moved in after stage (7). Hoskins settlers were moved in after stage (2). Stages (3) through (7) are handled by FELDA through experienced contractors who subcontract with itinerant labor gangs specialized at particular stages. Stages (3) through (7) are handled by the PNG Project Authority through intensive exhortation and technical extension, and by resorting on occasion to threats to withhold subsistence allowances or to evict the settler. Certain fixed dates on the critical path of the planting operation were emphasized to the settlers and helped the Project officers keep them to the schedule, e.g. the date of availability of seedlings, by which event holing had to be completed. Social pressure operated as well, since differences in clearing and planting speeds were obvious. There were some systematic shortfalls, for example housing construction by settlers gave the Project Authority so many headaches that it took over the job (by contracting) altogether in 1970, using the settlers thereafter only as unskilled laborers for the job. Also the Project Authority now fells all 12 acres (10 for palm, 2 for

subsistence) before settlement instead of only 6 acres (4 for palm, 2 for subsistence), and insists that all palm acres be planted at once, since the settlers tended to favor the first stage plantings and neglect the second. By and large, however, the self help principle has worked at Hoskins.

6.09 Whether there are any transferable lessons in this experience is not clear. Observers familiar with both Malaysia and PNG say that while the New Guinean is willing to attack the bush the Malay is not, and that the different strategies are not interchangeable. They also say that PNG had no choice, since a pool of experienced indigenous contractors did not exist (FELDA's contracts helped to develop the Malaysian contracting pool, nevertheless it existed before FELDA operations started). Further, tasks that can be handled by a project authority dealing with 1,600 settlers may be impossible when dealing with ten times that number. Nevertheless there were some in the Bank in 1968 who argued that the Hoskins strategy ran too many dangers, and that too many responsibilities had been loaded on the PNG settler. Experience shows otherwise.^{1/}

F. Costs per Settler

6.10 One popular argument for settler self help is that it reduces the project's cash costs by reducing the labor bill. Since all settlers were given A\$8 per month (increased to A\$10 in 1975) as a living allowance to support their cash needs till production started, any work after their arrival that they did not do themselves would incur additional costs to the Project Authority and have to be added to the settlers' debt. It was preferable to shift as much as possible to the settler, since he was being paid anyway and since the living allowance was considerably below the local wage rates in 1968 and the gap has widened since. Also, the shortage of labor locally would have in any case required the import of workers. In some jobs the unskilled labor bill was a minor component of settlement costs, and here the Project Authority was more likely to substitute contract labor for settler labor wherever necessary to ensure that schedules and standards were met. The budgetary implications of such a shift were not substantial. Housing is a case in point. The 1974 cost estimate per settler house at Kavugara was US\$450. Of this, the unskilled labor bill - the cost of the jobs in which the settler was not already helping - was only \$10. The rest was spent on materials and special subcontracting assignments such as well digging. The Project Authority had found earlier that the time it took to help settlers set their plumb lines, and straighten out queer angles, was not worth the saving. But in other jobs the use of settler labor provided

^{1/} The Project Authority argues that the large self-help component in the development work builds a necessary element of pride and self-reliance in the settler's farm operation. The point is not highlighted in this report, since it is so difficult to prove. This treatment does not constitute rejection of the thesis.

substantial savings over contract labor: the entire chain of development operations from clearing through to maintenance is the important example.

6.11 Hoskins is compared in the Bank with the Malaysian settlements and rated as a desirable example of low cost settlement. The comparison is valid, but the difference is not as substantial as sometimes assumed. (Within PNG Hoskins is more often described as a high cost operation, in comparison with previous settlement ventures in the Territory where practically nothing was done by government, especially on infrastructure.) The self-help formula saves money, but not much. The major difference between Hoskins and Malaysia is due to the large FELDA overheads and the administrative expenses attributable to each FELDA subdivision for management of the maintenance and production systems. But that difference is narrowed when the extraordinary costs of settlement services at Hoskins are fully counted. Some of the services provided by FELDA are provided at Hoskins by other agencies and missed in the standard listings of project costs. ^{1/} A good example is the NBPOD management service for the mill and transport. ^{2/} With some omissions, including that of the NBPOD management factor, the average costs per settler and per planted oil palm acre at Hoskins have been reckoned by OED at US\$5,500 and US\$630 respectively. These figures compare with US\$11,000 and US\$800 at the Jengka, the best known of the big FELDA operations. ^{2/} Twice as much is spent on the FELDA settler, but he gets 14 acres of oil palm instead of 10 acres. The FELDA per acre costs are 27% higher than those at Hoskins (these comparisons ignore the fact that Hoskins has a nucleus estate and FELDA schemes do not).

6.12 The point is that this type of settlement is expensive in either country. The costs are clearly defensible when the cash crop is as lucrative as palm oil and the project is implemented as successfully as it was at Hoskins. But it is too expensive a proposition for government to use in the near future in PNG to affect large numbers of smallholders, which is the reason why the Hoskins system was never seriously offered as a means to relieve population pressures. This statement is not meant to challenge the settlement concept; it simply points to the fact that development of new resources, and job creation, is not cheap.

G. Block vs Individual Farming

6.13 The Hoskins operation is distinguished from present FELDA procedures also with respect to the organization of the production force. Hoskins settlers cleared, planted, maintained and harvested as individuals, ^{3/}

^{1/} The settler pays for them via the formula by which the farm gate price is derived, but they are not entered as a cost (with an offsetting benefit) in the Project accounts.

^{2/} Raja Muhammad Alias, "Pioneering into the Interior, the Malaysian Experience" FELDA, October 1975, p. 16.

^{3/} The first settlers arrived in batches without families, and lived in temporary dormitories in the new schools or community centers while they cleared the first 3 acres, built the homes and planted subsistence crops. Some of this early work was organized by collective settler gangs (in fact some of the settlers were selected from the labor gangs that had been hired for the pre-clearing operation).

and each can identify with a specific 10 acre plantation and a home on it. FELDA oil palm settlers live in villages, are organized in teams of 20, and, in principle, cannot differentiate an individual holding within the 200 acre "block" (20 x 10^{1/2} acres). FELDA oil palm settlements used to be organized individually (though the FELDA settlers always lived in villages), but the strategy was altered around 1969 because it was felt that high oil palm maintenance standards and ffb delivery schedules could only be guaranteed by FELDA if it organized the labor force into units on which group pressure and official pressure would be more effective.^{2/} We may again be confronting a decision that has had to be tailored to each country. It is said that larger cooperative blocks mixing Chimbu, Sepick, and Tolai settlers would have disintegrated (some of the Hoskins subdivisional marketing and service cooperatives, most of which have collapsed, collapsed because of tribal jealousies). Nevertheless, the Hoskins experience to date does suggest that the technical and managerial problems of a 10-acre oil palm plot can be solved.^{3/} Both positions were argued in the 1968 appraisal debate over the Hoskins strategy.

H. Villager vs Settler Production

6.14 The Bank's 1967 economic mission opposed TA support for massive resettlement programs, arguing instead among other alternatives that the government should emphasize the "village concentration" strategy - developing the economy of existing villages. The theme recurs in the report of the Bank's 1969 economic mission, which emphasized the legal difficulties that sale and subsequent lease of tribal lands to outsiders inevitably led to, given the sense of inalienability all PNG tribes are alleged to feel for their homelands (whether or not government had "purchased" it). Since local village populations in the Hoskins area were too small to provide a large enough base for smallholder production in association with the nucleus estate, settlement in this case was recognized to be essential. Nevertheless, the Project Authority promoted oil palm production in eight local villages (map) along plot design lines similar to those of the settlers. Roughly 1,300 acres of palm have been planted near the villages (compared with 13,700 acres for settlers), and access roads upgraded. Maintenance and yield standards have been considerably below those of the settlers, though villager performance is improving. Additional land belonging to the villages is available, but demand by the villagers for assistance in oil palm development has been slow in materializing. Whether a more vigorous promotional campaign by the Project Authority would have significantly increased demand is unclear. The expansion of the Smallholder Project into

^{1/} The 10-acre average oil palm holding refers to the period before 1973. In that year FELDA increased the allocation to 14 acres planted per settler (with no significant food crop area).

^{2/} FELDA's rubber schemes remain divided in individual plots - an explicit distinction is thus made between the requirements of rubber and oil palm crops.

^{3/} The FELDA block system itself shows some signs of disintegration. Sub-groups within some blocks are differentiating specific areas for their exclusive attention, and pressure is apparently building up to assign all land individually: to return, that is, to the pre-1969 system.

villages was at the initiative of the Project Authority, and, for political reasons, preference now tends to be given to villagers over settlers to plant oil palm. For reasons that are obscure, the Bank seems to have taken a position, prior to negotiation of Cr. 137, that claims against villager blocks would not be eligible for IDA disbursement. In 1972, to help avoid cancellation of part of Credit 137, it accepted PNG requests that IDA accept costs of upgrading village roads. Village blocks are an integral part of the Popondetta proposal.^{1/}

I. Estate vs Smallholder Development

6.15 One can ask whether smallholder schemes have advantages over estates. It is clear that production efficiency, on the Mosa estate exceeds and is expected to continue to exceed that of the settlers, despite the fact that the best settlers can surpass average estate yields. HCG's updated formula for projecting settler yields assumes their average will not exceed 75% of the estate's. Thus, if HCG and the TA had agreed in 1965 to tackle the entire West Nakanai property as a single estate, total production presumably would by now have been higher.

^{1/} In a recent communication to OED, the Project Authority reports:
"A development policy and strategy has been designed to suit village block development. The block remains at 15 acres. The settlers can plant 10 acres of palms; however the PNGDB only lends sufficient money to cover the first 5 acres of palms, cover crop seed and initial fertilizer applications. The settler then has to show good husbandry standards, and clear and establish cover crops on the second block of 5 acres, before any further loan finance is advanced. In other words finance for non-producing expenses such as house and tanks is not advanced until the settler proves himself.

The reasoning of the above is that:

- (a) The Project Authority has no control on village settler selection.
- (b) Neither the PNGDB nor the Project Authority have control of land tenure on village land.
- (c) The village man has village social commitments that normal settlers don't have, and therefore does not have the time available to devote to his block that a settler has. It is thus thought best to have a smaller area looked after well than a larger area looked after poorly.

The latest two village oil palm schemes at Morakia and Gaungo are being developed along the above lines and crop standards to date are of a much higher level than earlier village oil palm blocks."

6.16 In terms of worker income and living standards, the two systems existing presently side by side at Hoskins are not easily compared. Labor's living conditions on the estate are good, especially for nationals in middle management and technical positions who have families and detached homes. Unskilled labor is mostly composed of single men, who live in single rooms, four rooms to a house, on the housing lines. But NBPOD encourages the migrant laborers to bring families, and those that do are assigned a small duplex house. It is less substantial than the settlers', but the worker has other special amenities (movies, etc.). Daily wages per laborer are much lower than the imputed daily wage of the smallholder. Nevertheless, NBPOD has tried to bring the wives into the labor force too - to help with pollination for example. When a laborer and his wife work together six days a week their weekly joint cash earnings almost equal those of the settler family from its 10 acre plantation (except during periods of high palm oil prices as in 1974^{1/}). But that equality ignores the fact that the weekly labor input on the 10 acre farm is about half that of the couple on the estate. In short, although the estate's labor force of 800 workers, including 80 working wives,^{2/} is comfortable compared with conditions in the tribal homelands, the settlers work less and, partly because of 1974, appear somewhat more prosperous.

6.17 Sound arguments have been advanced for the promotion of smallholder development along the lines of the nucleus estate concept, some of which are summarized here by the Project Authority:^{3/}

"The estate is protected by the fact that a large group of smallholders are dependent on it for processing and that any unfavorable moves against the estate will directly affect the smallholders.

"The settlers have protection by the government from the estate of being too unreasonable and also by the fact that the estate is largely dependent on the smallholders production to ensure the factory runs to capacity."

The principal argument for smallholder development, however, is that in contrast to exclusive expansion along lines of estate organization, the smallholder schemes establish a middle income proprietorial farming community.

1/ NBPOD has no scheme for sharing profits with labor, though, for that matter, it had not earned any profits until the 1975/76 season.

2/ There were 120 wives at the estate and mill in December 1975.

3/ Reference is also made to a paper written by T.A. Phillips of the Colonial Development Corporation called "The Possibilities of Nucleus Plantations and Processing Factories in Fostering the Sound Development of Organized Smallholder Production". Phillips had participated in the 1968 Appraisal Mission.

The attraction of that proprietorship, and of the independence of decision it affords, is substantial. This in turn is thought to provide political advantage and lend stability to the settlement. Some of the estate's skilled and unskilled laborers were selected for blocks at the outset, some have taken blocks that have become available after eviction or other form of dispossession, and many other workers are now on the waiting list.

J. Project Phase-Out

6.18 Project design included plans to eliminate the extraordinary project management unit and staff functions as soon as the settlers had reached full production. Routine extension and other services would pass back to responsible officers of the regular ministry staffs. Phase-out has been almost completed in some subdivisions. All expatriates have left subdivisional assignments and the number of PNG agricultural officers and assistant officers in all areas has been reduced. The objective is to bring those staff numbers down to the level which prevails throughout the rest of the country. The posts of the Project Coordinator, Field, and of his chief field assistant, the Project Supervisor, will disappear. Their supervisory functions are already being shifted to ministry representatives and chief officers of the provincial administration. The Project Authority unit will also disappear, leaving at most a project manager with residual reporting and expeditor assignments and appointed by and responsible to DASf. The whole graduation and phase-out design seems to be well conceived and the TA is following it.

VII. BANK PERFORMANCE

7.01 The Bank's input into this Project was smaller than in most of the Bank's agricultural projects. Design and implementation at Hoskins were handled by the Project Authority and HCG with minimum involvement of Bank appraisal and supervision. There was only one supervision mission to Hoskins each year between 1969 and 1975, usually consisting of one officer.^{1/} The average number of man-days of supervision spent at Hoskins was approximately four per year, a figure which excludes Project-related time spent in Port Moresby. The low intensity of supervision of the smallholder development seems appropriate, since the Project Authority proved itself competent to handle the logistics of settlement. Whatever technical support was needed by the project staff, none of whom originally knew anything about oil palms, was supplied by NBPOD or visitors from HCG offices in Sydney, Kuala Lumpur or London. When commenting on the version of the Project Completion Report drafted in Port Moresby by DASF in December 1974, the Bank suggested that the Project Authority had perhaps relied too much on supervision missions to solve Project problems. This could not have been the case with the main development activities at Hoskins, though it was probably accurate from time to time with respect to matters of inter-agency coordination at Port Moresby and also to the subject of the next paragraph. PNG officials spoken to during the audit visit were consistently complimentary about the supervision work, again with one exception.

7.02 The major weakness in Bank supervisory performance appears with hindsight to have been the permissive position adopted with respect to developments at the mill. Paragraphs 2.13 through 2.15 describe the process whereby the Bank lost some control over the mill before the Cr. 137 agreement was signed. Supervision mission members invariably visited the mill. A few of the mission members had substantial experience in oil palms and the palm oil production business. But none were engineers, and from 1967 to 1974 no Bank-sponsored consultant engineer ever visited the mill either. It would appear that progress at the mill appeared satisfactory to the supervision staff, and that, after problems developed in 1972 when ffb deliveries overloaded the new, single line, Bank visitors were also satisfied that NBPOD and HCG were together competent to correct the deficiencies. The supervision report of July 1972 commends the mill management for its performance in the face of start up difficulties.

7.03 The April 1974 supervision mission was accompanied by a palm oil processing engineer resident in Malaysia. He made a blistering attack in

^{1/} Actually, the Missions would average two members, one of whom would concentrate on the livestock component of Cr. 175. Both members would visit the PNG Development Bank and other headquarter agencies in Port Moresby.

his report on the inefficiencies of the Stork equipment and the Mosa mill operation as a whole. He felt those inefficiencies were the chief explanation why extraction rates were far below acceptable levels and the cause, therefore, of substantial losses to smallholder beneficiaries. The losses were hidden at the time behind the high prices and incomes of 1974, but would become painfully apparent he felt when prices returned to the normal level. The next year's supervision report repeated the criticism and doubts were voiced again in the Bank about the integrity of the HCG-Stork alliance. However, a more recent mission report dealing with Hoskins, dated August 1975, takes a more hopeful line, suggesting that NBPOD has surmounted its mill problems and signs of improved efficiency are already visible.

7.04 Opinion on the mill differ greatly. Project Authority staff at Kimbe told the auditor that the Bank's consultant had exaggerated the problems, and had done so without giving fair recognition to the burdens imposed by unanticipated ffb deliveries. The staff felt that the overall impact of the consultant report, notwithstanding useful insights and suggestions, had been destructive (this was the only negative comment cast at the Bank's supervision input). They pointed out that the consultant had an agency agreement with DeWecker and that his reporting could not escape the biases resulting from continuing commercial rivalry between DeWecker and Stork. NBPOD specifically refers to this bias in its vehement written denial of the consultant's allegations.^{1/}

^{1/} A senior officer of Harrisons Fleming Advisory Services Ltd., (the technical subsidiary of HCG), a person intimately related to the Hoskins Program since its conception in 1965, in communication with OED described another unfortunate influence of the 1974 supervision attack on the choice of presses:

"The trouble is that in making the choice of presses a major issue other very relevant points were lost to sight.

For example the water supply has been a major source of problems adversely affecting the efficiency of the whole mill operation. The chemical quality of the water had been checked both in the wet and dry seasons before the mill was built, but when it came to operating in the wet season a problem arose which had never previously been encountered. This was that fine pumice floating in the flood water blocked the specially selected pumps even when they were stationary, and when the pumps were running the same pumice clogged the water purification apparatus to an impossible degree.

A bore put down to eliminate the use of river water produced water too high in silica for use in the boilers and then failed. More recently the level of silica in the river water has risen to a dangerous level, presumably due to the volcanic nature of the country.

Resulting low temperatures and low steam pressure throughout the mill system have frequently been a major factor in mill performance.

Another factor which has been emerging in Malaysia concurrently with its emergence in New Britain is that Tenera palms (which are still relatively new in terms of perennial crops) do not necessarily crop consistently under all conditions. In particular the oil content of the fruit fluctuates much more widely than had been supposed. This happens particularly in monsoon weather, but also at other times. It is a problem which is now being investigated by both agronomists and engineers, but the fact is that even with screw presses operating efficiently oil recovery can fall seasonally to 15% and lower, and this effect is being experienced at Mosa with screw presses in operation."

7.05 The Bank had been aware of the consultant's relationship with DeWecker, but had used him on similar assignments in Indonesia and had no reason to question his professional integrity. He may not have been the first choice, but alternative experts known to the Bank were not then available. The Bank staff who accompanied him on the April 1974 Mission agreed then and agree now with his findings. The judgement will remain highly subjective, depending upon one's feeling about whether the mill difficulties could have been anticipated and easily countered. Members of missions prior to April 1974 disagree with the consultant.^{1/}

7.06 The point to make is that the Bank was inadequately covered with respect to mill affairs, and that Bank responses were inconsistent. With hindsight the picture seems clearer. The Stork hydraulic design has since been superceded. (Stork itself has converted to the screw press). The trend was not evident to all observers in 1966 and, as mentioned earlier, there were good reasons at Hoskins for HCG to stick with its Stork supplier. But Hoskins was a marginal enterprise for the HCG family, and an alert Bank may have detected the fact that HCG, with a mind for the risks involved, and with TA support, had moved very cautiously with respect to mill size to begin with. Also, until 1974 HCG had not given this isolated operation the benefit of HCG's best mill management experience, even as NBPOD struggled to catch up with its production problems.^{2/} Stork technicians themselves are reported to have been critical of the mill's first engineer. Further, as also mentioned earlier, NBPOD tried to develop the operation with as small an expatriate staff as possible. To compensate for these deficiencies, or at least to ensure that the factory component developed properly, the Bank should have added engineering expertise to its missions earlier than it did.

7.07 A general deficiency in the engineering end of those of the Bank's agricultural projects with processing as well as production components was recognized by the Bank in the late 1960s. The agro-industries unit was established in the Agricultural Projects Department in 1970 precisely to cover that gap. The Smallholder Project may be an example of an older project that slipped through that screening unit, not only because the two credit agreements were signed before 1970 but also because Bank funds were not committed to the processing side. Whether the lesson has much relevance elsewhere is uncertain, however. Apparently the Mosa mill is the only one of eight palm oil mills in projects supported by the Bank in which criticism of the mill design had become a major issue. However, a Bank mission has recently returned (June 1976) from Malaysia where the FELDA mills in

^{1/} The April 1974 Mission included no one with prior supervision experience on this project. In fact none of those earlier mission members were to return to Hoskins. The latest mission reports (August 1975 and August 1976), offering greater hope, were written by yet two new teams of authors. It cannot be concluded however that the April 1974 team was unduly negative. One of its members returned several times to Hoskins, and, according to the Project Authority, was their most appreciated Bank visitor.

^{2/} HCG changed the NBPOD management in 1974.

Bank supported projects were supervised for the first time. The consultant engineer is reported to have reached conclusions not unlike those of the Bank's consultant at Mosa. Mosa may not be the only case where the Bank's gamble that highly reputed private enterprises should have been left to proceed without the salutary stimulus and observation experienced supervision can provide, was not entirely justified.

7.08 It must be added that there is too much evidence of positive action taken by HCG with respect to the Smallholder Project throughout the Project's history for OED to accept the consultant's implicit comment that HCG's actions are explained by unenlightened decisions on maximizing profits. Many of the comments made about the determination and capability of the Project staff could also be addressed to the HCG and NBPOD staff, who made that half of the Program work.

7.09 This is the point to introduce one of the major lessons the Bank is said to have learned from this experience, though we will use the language of HCG:

"Of all the lessons learnt from this operation one of the most emphatic would be that in any similar project in a similar location smallholder plantings should not be started until two years after a start is made on the nucleus plantation. The probability would be that crop from the first year plantings would not be harvested, so a two-year delay in smallholder plantings would give a year to run in the mill and train personnel."

7.10 Two other criticisms can be pointed at the Bank, both of them alluded to in chapter ii and related to one another.^{1/} First, the effort to convert the Hoskins proposal from a single crop production project into a component of a multi-purpose credit project had both positive and negative effects. On the positive side it gave PNGDB a broader constituency and wider experience, and thus greater claim for government support and a stronger base for constructive response to problems. Beyond that, the grouping of the components lent a certain administration convenience, though its value to IDA was questioned by the 1968 appraisal team and remains unclear. On the negative side it diverted Bank attention from a program that was already in progress.

^{1/} One other critical issue can be mentioned. The Bank has been criticized recently in the American press for having encouraged the palm oil industry at the expense of US soya bean farmers and other competing vegetable oil producers. Because of the small size of the New Britain scheme, this report would be a poor place to address the issue. Even after the Popondetta and Bialla schemes reach full production, assuming they both proceed, PNG will still provide only 2% of world exports. That low figure nevertheless allows palm oil to be the dominant growth pole in PNG's agricultural export plans.

7.11 Secondly, that effort to expand the project concept, coupled with timing lags that are built into the Bank's appraisal procedures, but rarely anticipated by governments, pushed back in time IDA's contribution of financial support under Cr. 137 to the point where it missed much of the important action. Retroactive eligibility would have brought the two operations - the field expenditures by the Borrower and the disbursements by the Bank - back into line, but retroactive eligibility was denied to Cr. 137.

7.12 When the Bank is substantially involved in major discussions of development strategy (economic missions of 1963, 1967), and supports and encourages preparation work, there ought to be a more useful interpretation of the retroactive rule so that an energized project authority need not have to seek funds, other than those originally and jointly identified for Bank disbursement, to avoid having to postpone field operations. The record suggests that TA had reasonable evidence to expect Bank disbursements to begin at least a year earlier, and its vigorous activity in getting the project going should not have been penalized. There are good reasons for the Bank to take a conservative position with respect to retroactive finance but there may be countries without access to alternative sources of funds for which the penalty could have been considerably greater. In this case, the main penalty was not large -- loss of 16% of the value of Cr. 137 funds as yet undisbursed in harder currencies at the time of the U.S. dollar devaluation (May 1972) and the Australian dollar revaluation (December 1972).^{1/} The Bank paid a penalty too, in staff time devoted to the search for and review of later-day, unplanned proposals for ways to finance residual expenditures of the project it had helped identify.

7.13 The same issue can be inverted, however, and cited as one of several examples of positive Bank input to the Project. When the size of the preeligibility expenditures was realized, and the threat of cancellation became clear, the Bank was generous, with Cr. 137 funds and, later, for different reasons, with Cr. 175 funds, in allowing the TA to submit supplementary expenditure programs for IDA finance. The Territorial Administration wanted the IDA funds. The Bank was willing to accommodate, especially since the Project it had intended to finance was on its way to being completed with surprising success.

7.14 The Bank can also take satisfaction in its decision in 1967 to support an oil palm project based on a risky settlement scheme on a remote frontier. The success ought to make similar decisions easier in the future. The choice of the site was also clearly correct.

^{1/} An exchange adjustment of US\$247,000 has been assessed on the Cr. 137 disbursements (US\$1,459,000). If Cr. 137 had been fully disbursed before May 1972, the "loss" (of access to hard currencies at IDA terms) would have been avoided, but the exchange adjustment would have been higher. The exchange adjustment assessed on Cr. 175 (US\$5,000,000) is US\$518,000.

7.15 The Bank's forecasts of yields and prices at appraisal, and the sensitivity calculations that were performed in 1968 in response to the deterioration of palm oil export prices that year, can only be described in hindsight as cautious and conservative. None of the overoptimism that OED has detected in some other agricultural projects is apparent. The fact that two of the components of the project prepared for appraisal were eliminated by the mission on economic grounds further illustrates the discipline exercised by that team. One TA official remarked later in a note in the files that he was neither surprised nor disappointed that the smallholder rubber scheme had been knocked out. He thought it had been prepared too rapidly, in order to help fill out the omnibus credit project, with insufficient technical justification. During 1968 the Bank staff reduced the palm oil price estimates and continued to test the viability of the project at prices much lower than the minimum level then expected. ARI and ARII forecasts assumed a price of US\$160 per ton CIF Europe, but tested rates of return at levels down to US\$120. This range was to prove extremely conservative, as illustrated in figure 1. By November 1971, when the first vessel left Kimbe, the actual export price was 50% higher than the forecast, and the farm gate price was twice as high as forecast (A\$30 vs A\$14, see figure 2). The Board shared the staff's anxiety over prices when discussing Cr. 175 in January 1970, a time at which several Bank palm oil projects were before it.

7.16 Finally, Bank supervision apparently did have a notable impact on certain components of the Hoskins Program. Australian expatriate officers obviously can claim major credit, along with the DASF national staff, HCG staff, and the settlers, for the outcome. But DASF inputs in earlier assignments were not always as efficient. The attention DASF gave to Hoskins, and the high quality of the senior officers that DASF pulled from other posts and sent to Hoskins, were in part the result of Bank insistence during project preparation and appraisal that extraordinary effort was essential. The Project Coordinator (HQ and Field) administrative structure, which worked well for several critical years, was apparently also partly attributable to Bank advice. Both examples refer to institutional organization and management, and that was probably an area where the Bank had something to contribute that HCG could not.

VIII. CONCLUSIONS

8.01 The Project must be considered a success with respect to all its major objectives - production, export earnings, stable settlement and smallholder prosperity. The start-up problems at the mill have provoked criticism, some of it apparently justified, from recent Bank supervision missions and from some Port Moresby officials, but these problems are to a large extent the consequence of the main element of success itself, the unexpected, excellent, early smallholder harvest. If one tries to discern the elements of success, three seem to dominate. First, the geographic conditions of this well chosen site were ideal, though remote. Second, the settlers were prepared to work hard for three years without cash returns. Third, the expatriate Project field officers, many of them trained in PNG's unique wilderness and accustomed to finding extraordinary solutions to major and minor crises, held the project to its timetable. Enthusiasm and determination were also shown by most NBPOD (and other HCG) personnel. The Bank's role was relatively minor, although some elements of the special project management system can be traced to early and insistent Bank advice.

8.02 Replicability must be considered also. Similar soil conditions exist elsewhere in the country, and smallholder vigor presumably is undiminished. But the administrative superstructure in Port Moresby changed completely following home rule and independence, and the third vital element of success mentioned in the last paragraph, the effective, flexible management system, would have to be redesigned so that it depended much less on the expatriates' "old boy" relationships across agency lines and much more on well defined assignments for the several ministries, as well as on empowerment of the project unit to command other governmental resources. It should be mentioned that the expatriate staff is satisfied that the local staff who will ultimately replace them will not have a problem succeeding in follow-on projects if the issue of authority can be settled satisfactorily. The role of the experienced foreign staff of the nucleus estate company will continue to be important, of course.

8.03 The peculiar temporal relationship of the Bank to the Project, which, given the Bank's insistence on not accepting retroactive finance, led to a situation where the Bank and the Project Authority had to look for ways to spend IDA's small financial contribution from Cr. 137 after the physical works of phase one were virtually complete, suggests a measure of inefficiency in planning for a useful Bank contribution. Abandonment of the retroactive policy would have eliminated the problem, but since the penalty was small in the final analysis the project does not offer a strong challenge to the policy. Nevertheless it does show that there is a class of projects, with critical paths established by initial investments made on good faith of timely Bank support, where subsequent Bank delays can pose a real threat to project performance despite the declared interests of all parties.

8.04 Success would sour if the world palm oil market collapsed. The Bank conservatively forecast palm oil prices during appraisal in 1968 and 1969, and nevertheless calculated acceptable rates of return. OED calculations show that updated, conservative forecasts still produce acceptable returns and optimistic forecasts produce remarkable returns. Nevertheless, the Hoskins settlers are entirely dependent on the palm oil market for their income, and many settlers would leave if cash returns fell below some level which has yet to be tested. For this reason, and because the producing 8 and 10-acre farms do not provide work for more than one adult, the stability of Hoskins as a family settlement community depends in part upon the creation of secondary employment opportunities in the immediate neighborhood. That is not an easy assignment, but it is one of the second generation issues to which government must now give attention. It is complicated by the fact that the settlers are already privileged by government services, vis-a-vis indigenous villagers, and further development cannot continue to single out the settlers for special favors.

8.05 Some commentators have criticized the Smallholder Project for already creating just such a class of independent farmers with incomes and privileges the government cannot offer to any but a tiny percentage of the country's tribesmen. The criticism is at the same time misleading and compelling. Misleading because it suggests a level of luxury at Hoskins which is nowhere evident yet. These are still poor farmers by most international standards - the windfall profits of 1974, which are not expected to be repeated, notwithstanding. Compelling because an important distributional issue is involved. The plot size can be further subdivided to spread the wealth, though that would further aggravate the potential problems caused by under-employment, since 10 acres cannot even employ a family. To take full but equitable advantage of the national treasure of uninhabited soils, it would appear that the other choices are to run the business as an estate (private or public), transferring the incremental profits to the PNG Treasury, or to settle similar size blocks with smallholders but to impose an effective income or export tax system that was fair to both the block holders and their poorer countrymen. Simultaneously, the government could encourage the settlers to do more of what they are reportedly already doing, that is, sending or carrying the savings back to the tribal homelands to finance productive investments. Such a strategy would imply that government should try to guarantee the flow of family and funds back and forth. Repatriated earnings have been an important stimulus to growth in many other rural societies.

ANNEX 1

TABLES AND FIGURES

TABLE 1

WORLD PALM OIL PRODUCTION AND EXPORTS

	Production				Exports			
	1965-69		1970-74		1965-69		1970-74	
	1,000 MT	%	1,000 MT	%	1,000 MT	%	1,000 MT	%
WESTERN AFRICA	751	53.9	995	43.0	106	15.0	86	6.4
Nigeria	432	31.0	533	23.1	65	9.2	6	0.4
Ghana	49	3.5	61	2.6	-	-	-	-
Cameroon	48	3.5	58	2.5	8	1.1	7	0.5
Liberia	41	3.0	7	0.3	-	-	-	-
Sierra Leone	41	3.0	58	2.5	-	-	-	-
Angola	36	2.6	75	3.2	13	1.9	7	0.5
Dahomey	33	2.4	43	1.8	11	1.5	12	0.9
Ivory Coast	31	2.2	91	4.0	1	0.1	49	3.6
Guinea	14	1.0	41	1.8	-	-	-	-
Other	26	1.8	28	1.2			5	0.5
EASTERN AFRICA	173	12.4	183	7.9	114	16.2	90	6.7
Zaire	171	12.3	180	7.8	114	16.2	90	6.7
Other	2	0.1	3	0.1	-	-	-	-
LATIN AMERICA - CARIBBEAN	53	3.8	92	4.0	4	0.5	5	0.4
Mexico	13	0.9	11	0.5	-	-	-	-
Brazil	10	0.7	7	0.3	-	-	-	-
Costa Rica	10	0.7	14	0.6	-	-	-	-
Colombia	10	0.7	39	1.7	-	-	-	-
Other	10	0.8	21	0.9	4	0.5	5	0.4
EAST ASIA - PACIFIC	417	29.9	1,043	45.1	459	65.2	1,104	81.9
Malaysia	240	17.3	728	31.5	232	32.9	674	50.0
Indonesia	176	12.7	274	11.8	154	21.8	230	17.0
China Rep.	-	-	40	1.7	-	-	-	-
Singapore	-	-	-	-	74	10.5	196	14.6
Other	-	-	1	0.1	-	-	4	0.3
TOTAL	-	-	-	-	22	3.1	63	4.6
WORLD TOTAL	1,394	100.0	2,314	100.0	705	100.0	1,348	100.0

Source: Appraisal Report on the Popondetta Smallholder Oil Palm Development Project, September 24, 1976, Annex 11, Tables 1 & 2.

TABLE 2

ANNUAL PLANTING PROGRAM COMPLETED

Area Planted (acres)	<u>Settlement Program</u>					Total
	Cr. 137	Cr. 175	Settlement Total	Village Smallholders	Mosa Plantations	
1967/68	-	-	-	-	415	415
1968/69	1,154	-	1,154	-	1,000	2,154
1969/70	2,130	-	2,130	76	1,010	3,216
1970/71	1,156	2,096	3,252	309	1,145	4,705
1971/72	20	2,421	2,441	540	695	6,676
1972/73	26	2,489	2,515	135	1,625	4,275
1973/74	-	972	972	-	100	1,072
1974/75	10	291	301	-	-	301
1975/76	70	890	960	240	173	1,373
TOTAL	4,566	9,159	13,725	1,300	6,163	21,188
Total Number of Blocks	584 ^{1/}	1,007	1,591	180		
Total Number of Settlers	579	969	1,548	180		
Unallocated Blocks	-	-	-			
Vacant Blocks (allocated but not occupied; Nov. 1975)	5	38	43			
Appraisal Projections						
Cr. 137	4,640 acres planted by 580 settlers by June 1972					
Cr. 175	<u>7,840</u> acres planted by <u>980</u> settlers by June 1975					
TOTAL	12,480		1,560			

Note: The block size in the sub-divisions Kapore, Tamba, Sarakolok (Credit 137) and Buvussi (Credit 175) is 8 acres of oil palm. The block size in the sub-divisions Galai, Kavui and Kavugara and in all plantings after January 1, 1975 is 10 acres of oil palm because of a change in the stand per acre from 60 to 48 palms. Each smallholder thus has 480 oil palms.

Sources: Annex 3, Table 1, Supervision Report April 1975.

^{1/} See footnote to table 3.

Table 3

SUBDIVISION DATA

Subdivision	Total Blocks	Vacant Blocks (Nov. 1975)	Settlement Started (CY)	Harvest Started (CY)	Roads (Km) (Aug. 1975)	Children at School (Aug. 1975)
Phase One (Cr. 137) ^{1/}						
Kapore	134	-	1968	1971	19.0	189
Tamba	193	-	1968	1971	30.8	325
Sarakolok	257	5	1969	1972	39.5	338
Total	584 ^{1/}	5			89.3	852
Phase Two (Cr. 175)						
Buvussi	397	7	1970	1973	53.5	400
Galai	210	10	1971	1974	30.1	180
Kavui	239	13	1972	1975	35.3	391
Kavugara	161	8	1972	1975	21.1	190
Total	1,007 ^{1/}	38			140.0	1,161
Village Smallholders	180	-	1970	1973		

^{1/} Cr. 137 - Includes 13 blocks in Tamba and 4 blocks in Kapore financed by Cr. 175.

Source: Nahavio

TABLE 4
LOAN TO SETTLER
(Australian Dollars)

	PHASE ONE		PHASE TWO
	Cr. 137 Appraisal Report (December 1968)	Cr. 137 PCR Actual, Kapore (May 1975)	Latest Model (May 1975)
	(1)	(2)	(3)
Removal Expenses	60	60	150
House and Utensils	394	350	400
Subsistence Allowance	} 452	{ 140	140
Living Allowance		{ 312	360
Tools and Equipment	44	60	171
Planting Material	379	360	480
Presettlement Felling	75	75	140
Chain Saw			50
Pest and Disease	} 168	{ 30	60
Fertilizer		{ 55	116
Contingencies, Fertilizer			150
Survey Fee			50
Legal and Loan Fees	18	16	21
Rental and Lease Preparation	} 386	{ 22	100
Capitalized Interest		{ 158	?
Other Expenses		50	
Other Contingencies	16		102
TOTAL	1,992	1,688	2,490

Sources: (1) ARI, p. 14; (2) PCR: Annex 5, Table 2 and Annex 1, Appendix p. 5;

TABLE 5

ACTUAL PROJECT COSTS, (Incomplete)
Showing IDA Contributions
(A\$ '000)

	Cr. 137 (Phase One)		Cr. 175 (Phase Two)		Cr. 137 & Cr. 175						
	(1) Total Before 137	(2) \$	(3) \$	(4) \$ After 137 Signed	(5) % of (3)	(6) % of (1)	(7) \$	(8) \$ Total of which IDA	(9) % of (7)	(10) \$ Total of which IDA	(11) % of (10)
Smallholding Development (Loans)											
Settlement & Field Develop.	963	185	778	544	70	56	1,267	1,138	90	2,230	75
Contingencies, incl. Fertilizer	77	-	77	-	-	-	190	-	-	267	-
Government Services											
Land & Roads	691	340	351	344	98	50	1,119 ^{2/}	875	78	1,810	67
Extension Services	546	160	386	357	92	65	385	257	67	931	66
Health, Education & Welfare	176	65	111	-	-	-	355	-	-	531	-
PNGDB Expenses	289	-	289	-	-	-	193 ^{3/}	-	-	484	-
Factory Company Services	673	-	673	-	-	-	300 ^{4/}	-	-	973	-
Totals	3,416	750	2,666	1,245 ^{5/}	47	36	3,811	2,270	60	7,227	49

^{1/} Figures in this column derived from Controller's Memo of June 16, 1976 (US\$1,366, \$1,050, \$308) using blended exchange rate of US\$ = 1.2 A\$.

^{2/} Includes 385 (=US\$500) for road costs added in FY 76. The US\$500 figure is an approximation of these additions.

^{3/} Not available in Bank. This is the Appraised Report Figure.

^{4/} Not available in Bank. This is guesstimate by OED.

^{5/} From PCR, but slightly inconsistent with actual IDA disbursements of US\$1,459.

Sources: Cr. 137 \$ figures all taken from PCR. Cr. 175 figures taken from Nahavio Worksheets Provided OED By Mail in January 1976, except as indicated in footnotes.

TABLE 6

SCHEDULE OF DISBURSEMENTS

End of Fiscal Year

	Cr.-137		Cr.-175	
	<u>Appraisal Estimate</u> (US \$000)	<u>Actual</u> (US \$000)	<u>Actual/Estimate</u> (%)	<u>Appraisal Estate</u> (US \$000)
1968/69	630			
1969/70	1,030			1,600
1970/71	1,340	874	65	3,300
1971/72	1,500	988 ^{1/}		4,190
1972/73		1,318 ^{3/}	88	4,690
1973/74		1,451 ^{3/}	97	5,000
1974/75				4,270
1975/76				5,000 ^{4/}
				Actual (US \$000)
				Actual/Estimate (%)
				1,667
				2,322 ^{2/}
				3,347
				3,666
				4,270
				5,000 ^{4/}
				51
				71
				73
				85
				100

1/ 2nd Quarter

2/ 3rd Quarter

3/ Excluding exchange adjustment of US\$247,000.

4/ Excluding exchange adjustment of US\$519,000.

Source: Cr. 137 PCR, Annex 4; Cr. 175 Supervision Report, April 1975 (updated by PNG Dec. 1975)

Table 7

IDA DISBURSEMENTS BY SUBPROJECT CATEGORY, CR. 175
Credit Agreement, Amendment, Estimated and Actual
(US\$ '000)

Category	1	2-3	4	5	6	7	8	UNALLOCATED	TOTAL							
										COCONUT		LIVESTOCK		OIL PALM		
										Settler Loans	Land Devel. & Roads	Settlement	Extension Services	Kimbe Wharf		
<u>Allocation of IDA Funds</u>																
Appraisal Report Dec. 69	340	1,730	680	680	800	750	20	5,000								
Agreement, Jan. 70	300	1,665	940	640	360	680	415	5,000								
(% of Allocated)	(7)	(36)	(21)	(14)	(8)	(15)										
Amended, June 74	0	1,510	1,280	605	315	700	590	5,000								
<u>Disbursements by IDA</u>																
Actual, Aug. 75	0	1,577	1,134	556	303	700		4,270								
Estimated, Dec. 75	0	1,702	1,590	667	333	700		4,992								
Actual June 76	0	1,577	1,366	1,050	308	700		5,000								
(% of Total)	(0)	(32)	(27)	(21)	(6)	(14)		(100)								

Sources: Cr. 175 Supervision Reports, April and November 1975; PNG Estimates, Dec. 1975; Bank Controller.

TABLE 8

TECHNICAL COEFFICIENTS

Forecast and Actual

	SETTLERS		MILL		Free Fatty Acid Content (% of Oil)
	Average Yields at Full Development (M Tons FFB Per Acre Per Year)		Extraction Rates Oil (% of FFB)	Kernel (% of FFB)	
1) Phillips (IDA Consultant) Alleged Optimal (February 1968)	11.0	-	22	3.5	2.9
2) Appraisal Reports, Cr. 137 & 175 Forecasts (December 1968, 1969)	8.5 - 9.0	-	21	3.5	-
3) Supervision Report Forecast (May 1975)	8.1	-	-	-	-
4) NBPOD Estimates, as Reported by Supervision (May 1975)	-	-	19	2.0	-
5) Harrisons Fleming Forecast (June 1975)	8.3	-	-	-	-
6) Progress Report, Actuals (January 1976) December 1974, Actual September 1975, Actual	- - -	-	18 20	1.0 2.1	6.0 3.2
7) Supervision Report August 1976*	-	-	20	-	3.3

* These estimates refer to the period May-December. During the wet season, January-April, the oil extraction rate averaged 16% and the FFA content ranged from 4.7% to 6.6%. See HCG comment in footnote on page 27 of the PPAR.

TABLE 9

PRODUCTION OF FFB AND PALM OIL AT HOSKINS^{1/}
(Metric Tons)

	FFB				PALM OIL	
	Settlers (Appraisal Estimate)	Villagers	Estate	Total	Extraction Rate	Total Production
1971/72	9,759	(3,500)	8,070	17,829	20	3,567
1972/73	21,711	(13,700)	17,644	39,482	20	7,896
1973/74	43,706	(23,550)	19,516	64,159	16	10,265
1974/75	67,229	(45,400)	28,954	99,268	18	17,868
1979/80 forecast						50,000

1 5 1

^{1/} Excludes Kernel Production.

Sources: Settlers and Villagers: Supervision Mission Report, Nov. 1975, Annex 3, Table 2;
Estate: Nahavio Estimates, received November 1975; Extraction Rate: 1971/4-
Supervision Report, May 1974; 1974/75-Progress Report, 1st Q 1976 (January 1976).

TABLE 10

ECONOMIC RATES OF RETURN
Smallholder Settler Sector

	67/68	68/69	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79-96/97	ERR
I. <u>Run 1 - Actual</u>													
Costs ^{1/}													
Development													
Phase One													
1 Subdivisions	272	475	709	635	292	70							
2 PNGDB				96	96								
3 NBPOD			224	224	224								
Phase Two													
4 Subdivision			258	752	674	765	294	142	50				
5 PNGDB				1502/	1501/		981/	981/					
6 NBPOD													
7 Operating Farms & Gov't						250 ^{3/}	250	250	250	250	250	250	
Total													
Benefits													
8 Production, M Tons of FFB					10,000	22,000	44,000	67,000	85,000	100,000	110,000	116,000	
9 Farm Price, M Ton of FFB ^{4/}					25	19	38	45	20	21	21	21	
10 Production Value					250	418	1,672	3,015	1,700	2,100	2,310	2,436	
11 Net Benefits, adjusted ^{5/}	-326	-570	-1,429	-2,228	-1,422	-916	1,030	2,525	1,400	1,850	2,060	2,186	19%
II. <u>Run 2 - Sensitivity to 1973/74 Prices</u> (assume constant 21 on line 9, thus line 10: -326 -570 -1,429 -2,228 -1,462 -872)													
12 Net Benefits					210	462	1,056	1,407	1,785	2,100	2,060	2,186	17%
III. <u>Run 3 - Sensitivity to Future Price Decline</u> (assume constant 7 on line 9, starting 77/78, thus line 10: -326 -570 -1,429 -2,228 -1,422 -916)													
13 Net Benefits							1,030	2,525	1,400	1,850	770	562	12%

1/ Sum of figures on each line corresponds to figures in table 5. The yearly breakdown is OED's best guess.

2/ OED Estimates. See table 5.

3/ Rough approximate of farm and government operating costs shown in Cr. 175 Appraisal Report.

4/ OED best guess of average price, based on figure 2.

5/ Figures in period 67/68 - 72/73 have each been increased by 20% to convert whole stream to constant 73/75 prices.

Sources: Tables 5 and 9 and figure 2.

Table 11

ETHNIC GROUPS

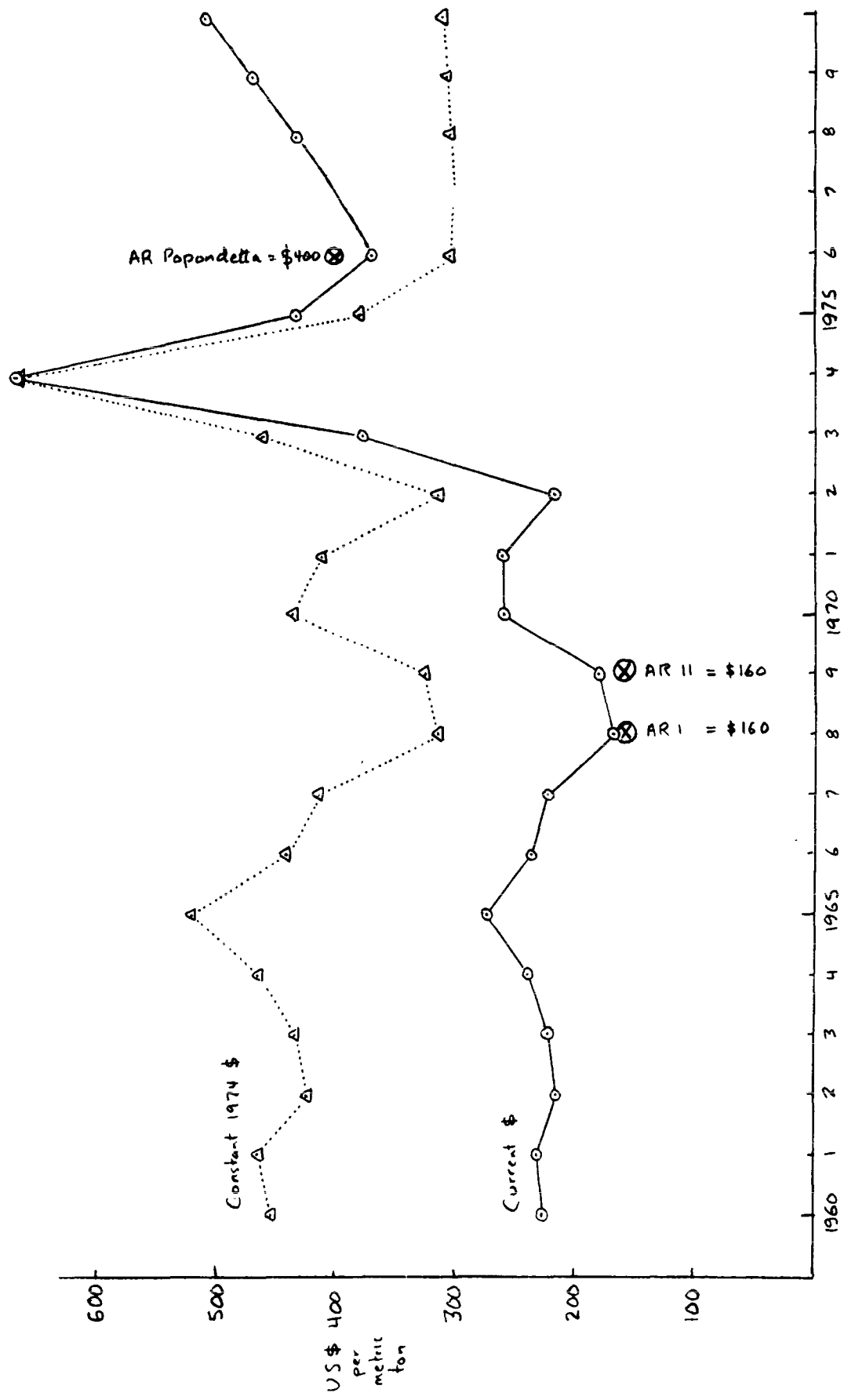
	<u>Cr. 137</u>		<u>Cr. 175</u>			<u>Grand Total</u>					
	<u>Kapore Tamba Sarakolok</u> ^{1/}	<u>Total (%)</u>	<u>Buvussi</u>	<u>Galai</u>	<u>Kavui Kavugara</u>	<u>Total (%)</u>	<u>#</u>	<u>(%)</u>			
Sepik	41	74	101	(38)	192	83	54	16	(40)	561	(39)
Chimbu	41	71	37	(26)	76	40	77	54	(29)	396	(28)
Tolai	35	-	23	(10)	42	20	44	15	(14)	179	(13)
Morobe	-	11	44	(10)	22	37	8	13	(9)	135	(9)
W. New Britain	7	13	33	(9)	18	6	22	-	(5)	99	(7)
Other Highlands	-	16	-	(3)	4	-	-	1	(1)	21	(1)
Other N. Guinea	2	1	9	(2)	1	-	1	5	(1)	19	(1)
Papua	3	5	2	(2)	5	1	2		(1)	18	(1)
TOTAL (table) ^{2/}	129	191	249	(100)	360	187	208	104	(100)	1,428 ^{1/}	(100)
TOTAL (Nov. 1975) ^{2/}	134	193	252		390	200	226	153			

^{1/} Equals 92% of all settlers as of November 1975.

^{2/} Table shows late 1974 counts and misses most recent Cr. 175 arrivals.

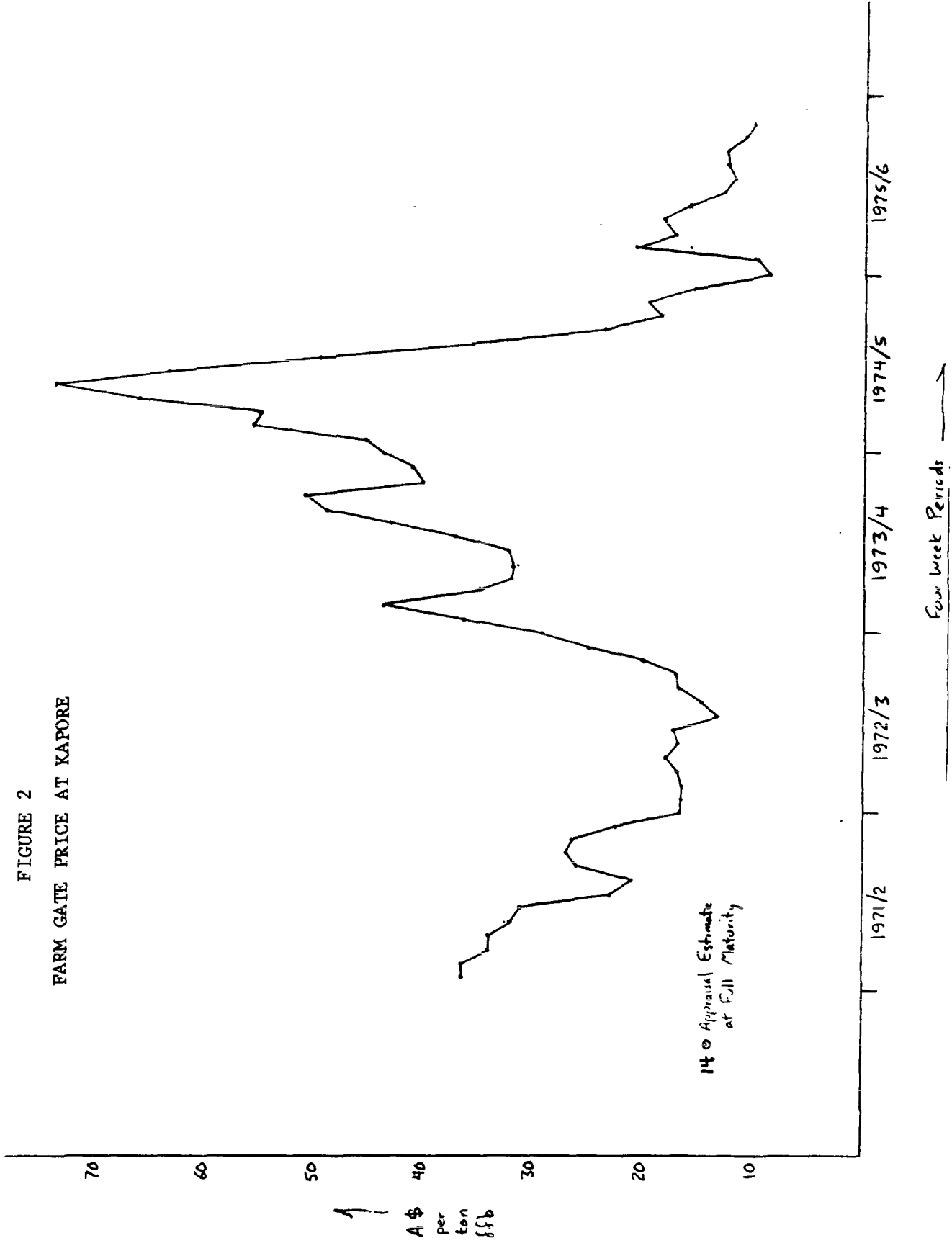
Source: Nahavio.

FIGURE 1
PALM OIL PRICE, CIF EUROPE, 1960-1980



Source: Annex 11, Tables 6 and 7, Appraisal Report, Popondetta, May 17, 1976 (Green Cover). Reference points added.

FIGURE 2
FARM GATE PRICE AT KAPORE



Source: Annex 2, Supervision Report August 1976 and Project Files.

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SETTLER SELECTION GUIDELINES

As Developed by Project Staff in 1974

"For the future, suggestions as to selection criteria were made at a meeting held early in 1974 between representatives of Departments of Lands, Agriculture, and Finance and the Development Bank. The conclusions of the meeting were summarized in the following points:

- (a) Ideal age for the settler is 30 years;
- (b) He be married with children;
- (c) Where possible, the wife be interviewed with her husband by the Land Board;
- (d) The settler be monogamous;
- (e) Man and wife be able to converse in Pidgin or Motu to assist in more rapid assimilation into the settler community;
- (f) Points be awarded for education;
- (g) Points be awarded for vocational employment experience;
- (h) Points be awarded for experience in community affairs;
- (i) Where practicable settlers be allocated land in modules of 4, i.e., that four families of the same ethnic group be allocated blocks together;
- (j) The Minister for Lands be advised that the Land Board include an officer of DASF and of Division of District Administration from the project area;
- (k) When the Land Board is working with a specific ethnic group, a settler in the project area and originally of that ethnic group be attached to the Board as adviser;
- (l) Medical report and character reports be incorporated in the interview form; and
- (m) Rural settlements be publicised in urban areas because urban residents are removed from the sheltered village community and are aware of the demands of a money economy, and because the project, once developed, becomes semi-urban with schools, transport, hospital and other amenities provided familiar to urban dwellers."

FARM GATE PRICES: CALCULATIONS FOR OIL PALM

	<u>1975</u>		<u>1978</u>						
	<u>Oil</u>	<u>Kernel</u>	<u>Oil</u>	<u>Kernel</u>					
CIF Price Europe: US\$/Metric ton	595	401	327	218					
A\$/Metric ton	440.74	297.04	242.22	161.48					
	<u>A\$/Metric Ton</u>								
	<u>Oil</u>	<u>Kernel</u>							
Freight	41.76	52.81	41.76	52.81					
Insurance	0.87	0.61	0.87	0.61					
Port Charges	0.38	0.38	0.38	0.38					
Brokerage)1.5% of								
Selling Commission) CIF price		6.61	4.46					
Exchange Rate Loss)2% of		8.81	5.94					
(3 months))CIF price								
Total Costs	<u>58.43</u>	<u>64.20</u>	<u>51.48</u>	<u>59.45</u>					
FOB Price (A\$/Metric ton)	382.31	232.84	190.74	102.03					
Export Levy - 2% of FOB price	<u>9.56</u>	<u>5.82</u>	<u>4.77</u>	<u>2.55</u>					
Net FOB Price	372.75	227.02	185.97	99.48					
<u>Local Charges</u>									
(a) Profits for Nucleus Estate Company - 5% of FOB (for processing)	<u>19.12</u>	<u>11.64</u>	<u>9.54</u>	<u>5.10</u>					
Sub-Total	353.63	215.38	176.43	94.38					
(b) Transport and Processing charges only made against oil; these charges are A\$ 5.50 and A\$ 13.46 per ton FFB respectively									
<u>Year</u>	<u>Oil Con- tent: (%)</u>	<u>Kernel Recovery (%)</u>	<u>Transp. Costs</u>	<u>Process. Charges</u>	<u>Total Charges</u>	<u>FARM GATE PRICE</u>			
1	18	3.0	30.56	74.78	105.34	248.29	215.38	71.09	94.38
2	19	3.2	28.95	70.84	99.79	253.84	215.38	76.64	94.38
3	19.5	3.4	28.21	69.03	97.24	256.39	215.38	79.19	94.38
4	20	3.5	27.50	67.30	94.80	258.83	215.38	81.63	94.38
20	20	3.5	27.50	67.30	94.80	258.83	215.38	81.63	94.38

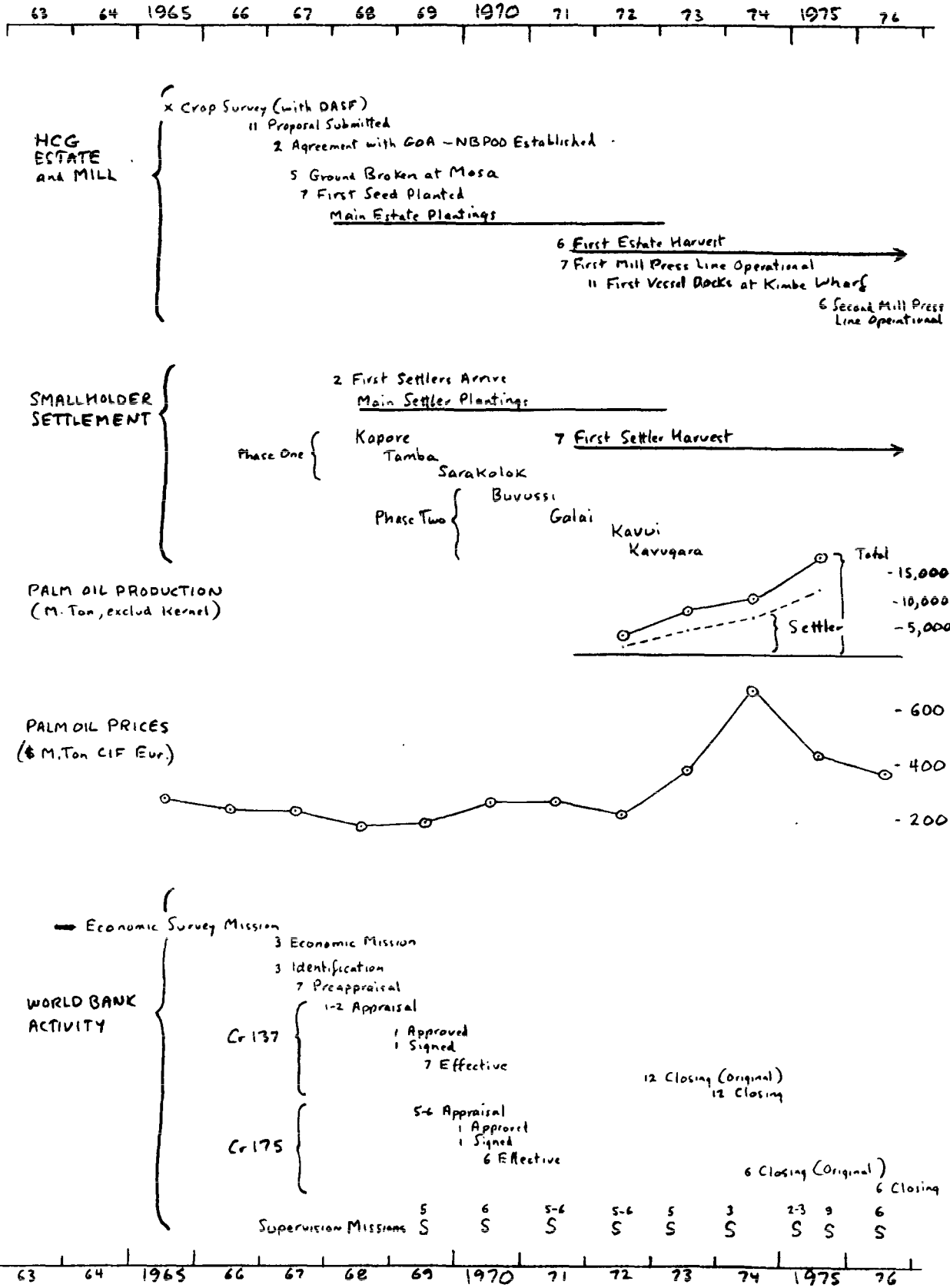
FARM GATE PRICE: FFB

Assumption:

	<u>Year</u>	
A\$ 1 = US\$ 1.35	1	51.15
£ 1 = US\$ 2.39 = A\$ 1.77	2	55.12
£ per long ton = US\$ 2.35 per m. ton	3	57.32
= A\$ 1.74 per m. ton	4	59.31
	20	59.31

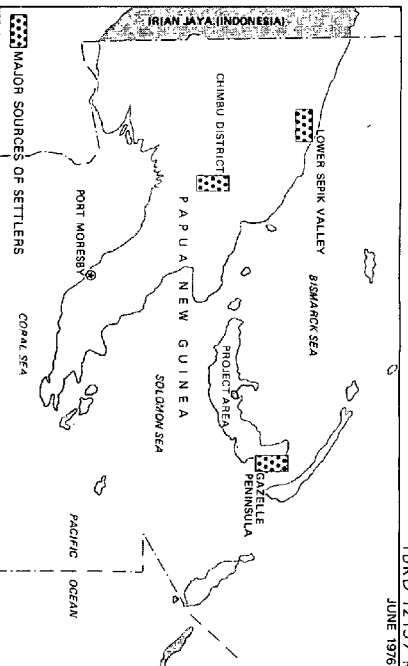
Source: Cr. 175 Supervision Report, April 29, 1975, Annex 3, Table 6.

ILLUSTRATED CHRONOLOGY
(Hoskins Program)



Note: Numbers preceding entries indicate month (3= March).

Prepared June 26, 76



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.

PAPUA NEW GUINEA WEST NAKANAI (KIMBE) OIL PALM SCHEME INCLUDING THE SMALLHOLDER DEVELOPMENT PROJECT

- CREDIT 137 SUBDIVISIONS
- CREDIT 175 SUBDIVISIONS
- VILLAGE OIL PALM AREAS
- MOSA ESTATE PHASE I
- MOSA ESTATE PHASE II
- DAGI COCONUT/COCOA SETTLEMENT AREA
- OIL MILL AND HOUSING AREA
- NAHAVIO PROJECT HEADQUARTERS
- COMMUNITY CENTERS
- DAMI RESEARCH STATION
- ASSOCIATED VILLAGES
- MAIN TRUNK ROADS, SEALED
- MAIN FEEDER ROADS, GRAVEL
- SAWMILL

