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THE MARKETING OF
COCOA AND COPRA
IN PAPUA NEW GUINEA

by
IAN LIVINGSTONE

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**INSTITUTE OF NATIONAL AFFAIRS
DISCUSSION PAPER NO. 37**

**THE MARKETING OF COCOA AND COPRA
IN PAPUA NEW GUINEA**

**with case studies of East New Britain and
East and West Sepik**

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May 1989

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FOREWORD

This analysis of the marketing of cocoa and copra incorporates the results of field surveys carried out in two contrasting areas of production in Papua New Guinea, East New Britain and East and West Sepik. The surveys were initiated and executed by a core survey team from the Department of Agriculture and Livestock, Konedobu, in collaboration with Ian Livingstone, and coordinated in East New Britain by Miri Areori, Project Coordinator for the Smallholder Cocoa and Coconut Rehabilitation and Expansion Project, and in East and West Sepik by Jeremy Darby, Economics and Marketing Officer in the West Sepik Development Project. We particularly welcome the opportunity that this study has afforded for a close collaborative effort between the Institute of National Affairs and the Department of Agriculture and Livestock.

Ian Livingstone is Professor of Development Economics, University of East Anglia, United Kingdom. He brought to this project wide geographical experience including Africa, South and South-East Asia and South America. Professor Livingstone was Visiting Professor at the University of Papua New Guinea in 1986, when he also delivered an address in the I.N.A. Speech Series.

This project is the first in the I.N.A.'s work to include field interviews. We thank Professor Livingstone for designing the project and leading his willing team by example. More the pity that convention precludes readers from enjoying Livingstone's accounts of crossing flooded streams and other excitements which he encountered. I.N.A. joins the author in thanking all those who worked with him on this project.

John Millett
Director
May 1989

ACKNOWLEDGEMENTS

I am grateful to the Institute of National Affairs and the Department of Agriculture and Livestock for sponsoring this study, and for the direct assistance and involvement in the execution of the rural surveys of members of the Department in Konedobu, Rabaul, Wewak, Aitape and Vanimo. Miri Areori, Project Coordinator in the Smallholder Cocoa and Coconut Rehabilitation and Expansion Project in Rabaul and Jeremy Darby, Provincial Economics and Marketing Officer in Vanimo, were directly involved in the planning as well as the execution of the surveys, as were members of the Department in Konedobu. Exceptional hospitality and practical assistance to the project were given in Rabaul by Mark Ivarami, Executive Officer of the Cocoa Board, and members of its staff, while a further debt is due to the Copra Marketing Board in Port Moresby for its cooperation and help. Further hospitality was accorded to the team in Aitape by Mr. R. Parer. Finally, we should thank the cocoa and copra growers who sat with us in the villages answering questions and offering comments, and who deserve some eventual indirect benefit from this study.

Ian Gillespie of the University of East Anglia made helpful comments on the econometric analysis.

The views expressed here are, however, those of the author only, who must bear responsibility for all errors and misconceptions. Comments and suggestions made are not offered in any critical spirit and are intended as a basis for wider positive discussion.

Note:

14 standard bags of copra = 1 tonne, 16 standard bags of cocoa = 1 tonne.
However, growers also use small flourbags for wet bean cocoa, weighing 25 kg.

Ian Livingstone
March 1989

RURAL SURVEY TEAMS

Department of Agriculture and Livestock, Port Moresby Headquarters team:

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G. Kauzi	Commodities Economist.

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West Sepik:	J. Darby Provincial Economics and Marketing Officer.
East Sepik:	B. Kongon Rural Development Officer/Provincial Statistician.

Other Survey team members

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S. Hayfield	Monitoring and Evaluation Officer West Sepik Provincial Development Project (WSPDP)
W. Madui	Counterpart Monitoring and Evaluation Officer, WSPDP.
J. Mango	Rural Development Technician, Poro
L. Bana	Rural Development Technician, Aitape.

Survey data-processing and analysis

J. Khauxha	University of East Anglia
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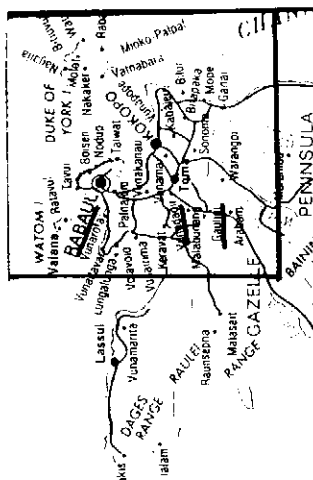
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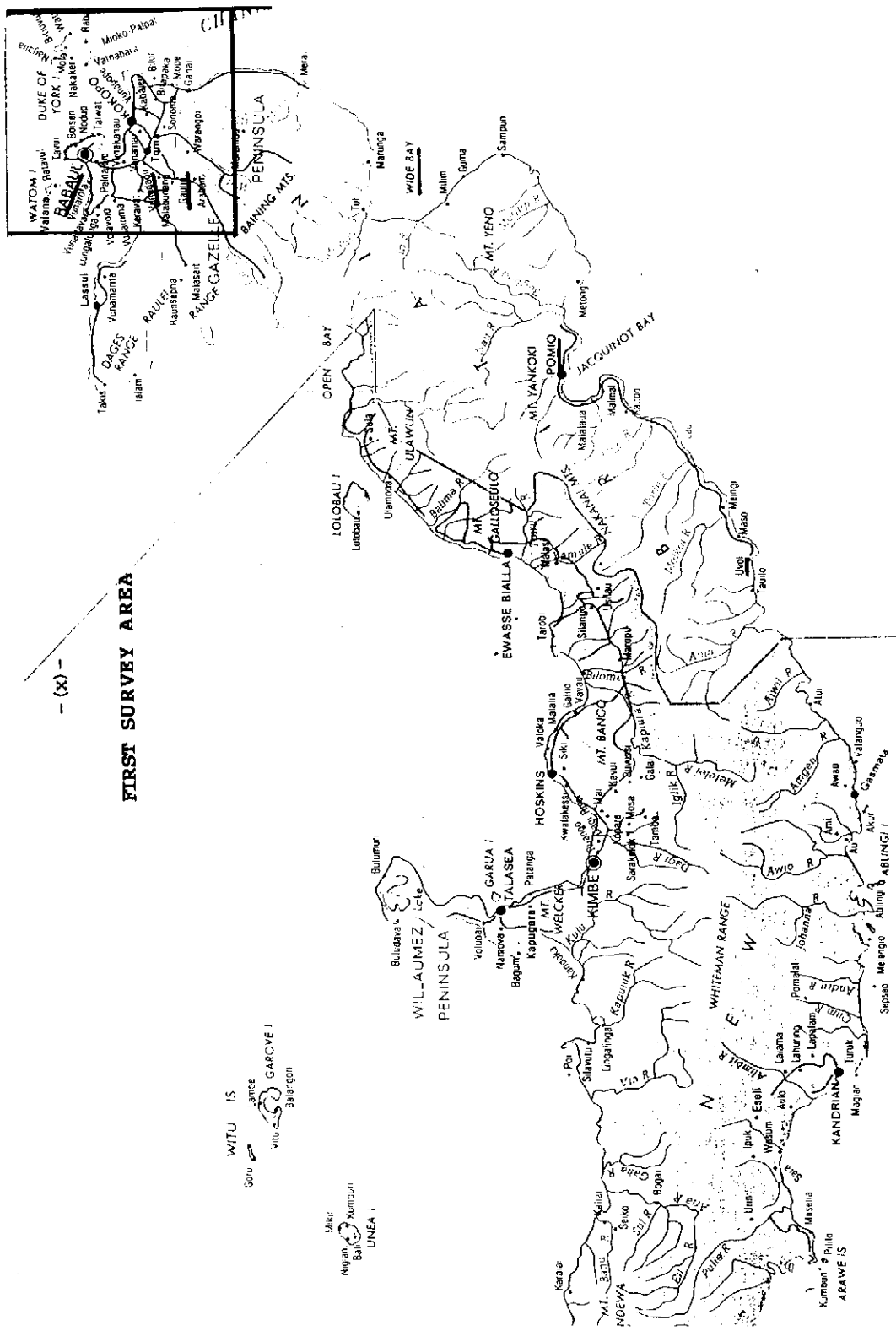
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FIRST SURVEY AREA

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Lance
Garove I
Balangon

UNEA I
Nagan
Balangon

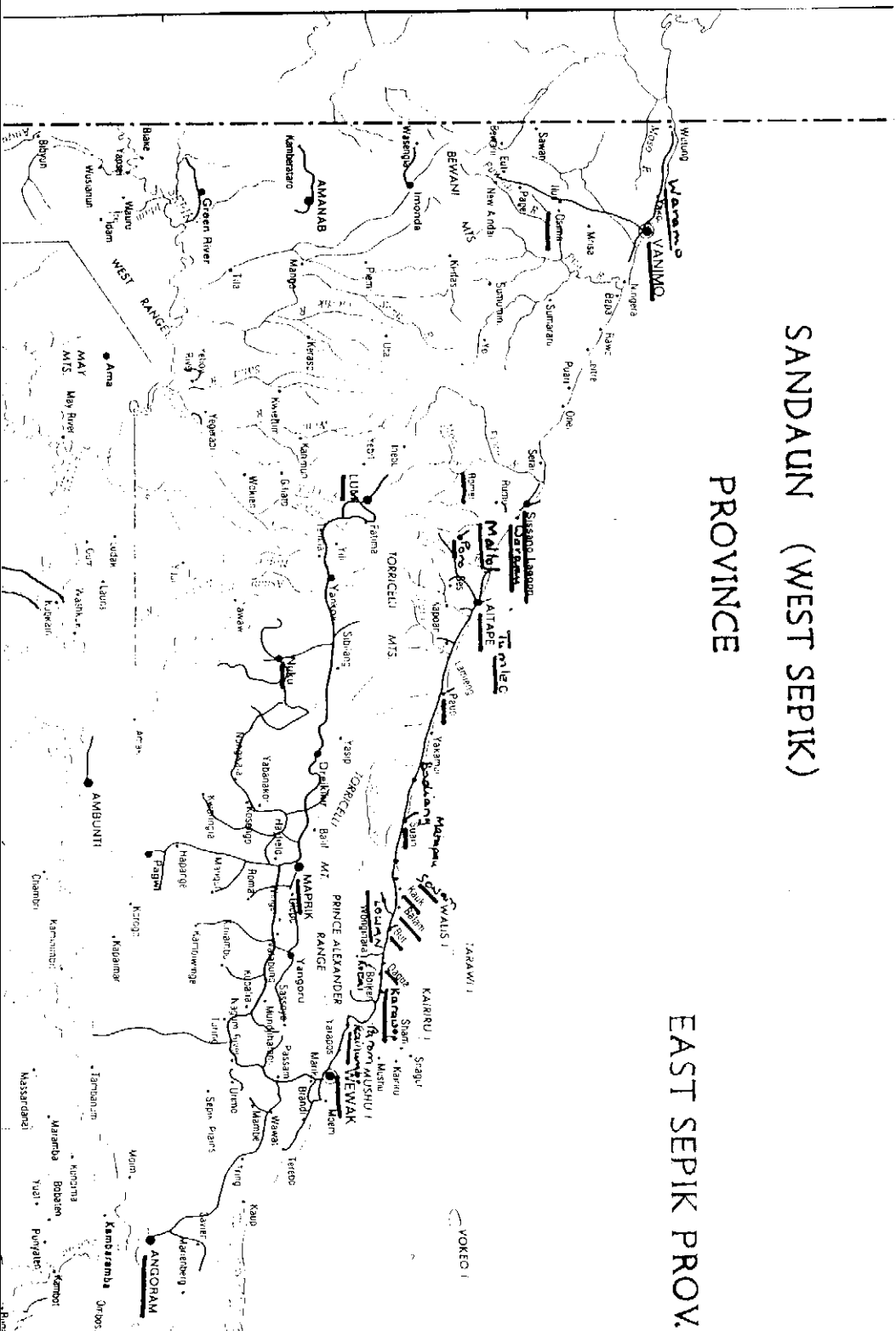
WIL-AUMEZ I
Peninsula
Garua I
Talasea
Palanga
Kapugara
Bagum



SANDAUN (WEST SEPIK)

PROVINCE

EAST SEPIK PROV.



**SUMMARY OF FINDINGS
AND RECOMMENDATIONS**

Readers may wish to turn directly to the self-contained
summary of the findings and recommendations of this
study, reproduced on pages 128 to 138

Chapter 1

INTRODUCTION

There are good reasons for focusing, as this study does, on the marketing of two of the major export crops produced by village growers in Papua New Guinea. The cash economy of Papua New Guinea was dominated in the past by mineral and plantation export enclaves with few linkages into the largely subsistence economy, not even contributing significantly to the development of basic infrastructure in the form of roads, especially. In 1986 there were in Papua New Guinea just 18,548 kilometres of road, of which only 1,119 kilometres were sealed (Table 1). This was just 4 kilometres of road per 100 square kilometres of area. To pay for the development of this infrastructure and, more important, to secure the involvement of villagers as a whole in the development of their country, an emphasis on smallholder production of high-valued crops is essential. The introduction of cocoa (and elsewhere coffee) has already produced major regional differences in cash income and economic welfare: just within New Britain, East New Britons enjoyed average cocoa incomes of K1,570 in 1985 compared with K111 in West New Britain (Table 2). Cocoa and copra are particularly valuable as smallholder crops, not only because they are technically relatively easy to grow, but because they yield regular cash incomes throughout the year.

Current government policy for the agriculture sector correctly emphasises smallholdings. A recent budget document (Government of Papua New Guinea, 1988, p.11) states, for instance, that :

"The Government's investment policy aims toconcentrate public resources on investment in smallholder activities which the private sector will not undertake and on the provision of infrastructure which is essential to development and growth."

In the absence of adequate infrastructure, transport and other marketing costs are likely to constitute a major obstacle to smallholder development. Information has been collected here in order to try to quantify these costs and their effect on grower incentives. However, the efficiency of a marketing system depends also on the role played by market intermediaries operating between grower and the point of final demand, and the degree of competition between them. Since smallholder development is relatively recent, and since also major policy changes were adopted to restrict the participation of non-nationals in internal marketing, it seems important to investigate at close quarters the effectiveness of the system and those involved.

The two crop boards play rather different roles. The Copra Marketing Board is solely responsible for the export of copra, over which it has a monopoly, collecting copra through a limited number, thirteen, of depots and sub-depots distributed round the country. It does not concern itself, however, with how copra reaches these depots from the grower and it is this, particularly, on which we focus in relation to copra. The Cocoa Board oversees and regulates the cocoa industry as a whole without, however, directly handling the crop. In addition to transportation, processing by fermentaries is important and marketing is for this reason more complex. The measures adopted by the Cocoa Board to promote efficient marketing are considered.

In order to obtain a more detailed picture of the marketing of cocoa and copra from the grower upwards, two areas were selected for special study involving interviews with villagers, transporters and processors : the Gazelle area of East New Britain and the coastal strip of East and West Sepik. In both cases villages were selected not at random but along a specific line of road, in order to see how transport costs varied along this line and to explore whatever marketing chain might exist along it. In the first case, cocoa production extends only a limited distance inland and of the five villages covered in sequence, Vunadidir, Malabunga, Taulil, Gaulim and Vunga, the innermost, Vunga, is some 50 kilometres from Rabaul. In Sepik a line was taken all the way along the coast from Wewak to Mallol, 15 kilometres west of Aitape, where the road ends, after which procedure was by lagoon and canoe to fishing villages at Warapu and Sissano and, as the lagoon terminated, by dinghy along the sea coast to Vanimo. From Aitape interviews were carried out in Tumleo, an offshore island, and inland at Siaute, Poro and Romei. From Vanimo interviews were carried on inland at Ossima and a short distance further along the coast at Waramo, towards the West Irian border.

The two survey areas contrast with each other in a useful way and are to an extent representative, East New Britain being an area of well-developed cocoa and coconut production, with good infrastructure, and East and West Sepik representing an area where production remains embryonic and suffering from infrastructural handicaps. Since very different policies have been pursued historically in the case of cocoa in the two areas, the comparison is even more relevant and useful.

Table 1
The road network in Papua New Guinea 1986, and the
distribution of public motor vehicles (PMVs)

Province	No. of PMVs 1985	Road mileage 1986			No. of km per PMV ²
		Paved (km)	Unpaved (km)	Total (km)	
Western Highlands	351	64	1,126	1,190	3.4
Morobe	290	191	1,121	1,312	4.5
Central	218 ¹	266	1,691	1,957	9.0
Eastern Highlands	150	140	1,329	1,469	9.8
East New Britain	127	142	1,058	1,200	9.4
West New Britain	104	33	899	932	9.0
North Solomons	87	60	1,155	1,215	14.0
East Sepik	77	28	1,062	1,090	14.2
Madang	58	56	924	980	16.9
Southern Highlands	49	31	1,455	1,486	30.3
Simbu	34	64	670	764	22.5
Oro	29	20	783	803	27.7
Manus	27	2	149	151	5.6
Enga	13	3	841	844	64.9
Milne Bay	9	2	330	332	36.9
Gulf	9	3	288	291	32.3
Western	7	4	490	494	70.6
West Sepik	7	3	628	631	90.1
New Ireland	5	9	1,400	1,409	281.8
Total	1,651	311	14,557	18,548	11.2

Notes: 1 Excluding urban PMVs
2 Figures include oil palm roads in Oro and West New Britain provinces.

Source: Planning Division, Department of Works

Table 2

The distribution of largeholder and smallholder production of cocoa
in Papua New Guinea, 1985

	Largeholder area under cocoa (ha.)	Smallholder area under cocoa (ha.)	Largeholder income from cocoa, 1985, at av. fermentary door price (K'000)	Smallholder income from cocoa, 1985, at av. fermentary door price (K'000)	No. of house- holds growing cocoa, 1980 census	Mean area per household (ha.)	Mean cocoa income per smallholder household, 1985 (Kina)
North Solomons	10,189	24,416	5,548	19,294	15,779	1.55	1,223
East New Britain	20,470	18,996	4,477	5,046	12,101	1.57	1,570
East Sepik	0	4,246	0	3,263	11,153	0.38	293
West Sepik	0	n.a.	0	62	3,431	-	18
Madang	7,008	8,748	1,322	1,153	9,973	0.88	116
Northern	828	n.a.	399	339	2,789	-	122
West New Britain	4,202	n.a.	470	387	3,486	-	111
New Ireland	7,944	4,159	886	504	6,046	0.69	83
Morobe	387	2,081	123	172	2,426	0.86	71
Manus	37	n.a.	0	88	795	-	111
Milne Bay	186	723	55	0	1,924	0.38	-
Western	)	n.a.	0	0	65	-	-
Central	)	48	0	1	334	0.14	-
Gulf	)	n.a.	0	0	205	-	-
All provinces	51,251	(66,726)¹	13,280	30,310	70,507	-	430

Note: 1 Estimated on basis of smallholder income column.

Source: Derived from Whitworth and Kiele (1986).

Chapter 2

DEVELOPMENT OF COCOA PRODUCTION IN PAPUA NEW GUINEA

Commenting on his impression that since 1974/75 production of cocoa in Papua New Guinea "appears to have stabilised at around 30,000 tonnes annually" the President of the Cocoa Merchants' Association of America, Mr. Johann Scheu, observed recently (Scheu 1987a) that the lack of further expansion had "surprised many observers who had judged the country's potential as being much higher". He goes on to consider possible explanations. In fact aggregative figures give a misleading impression of stagnation. It can be seen, in fact, (Table 3) that since 1976/77 (up to 1986/87) smallholder production of cocoa increased by 64 per cent. The very much slower rate of increase in total output was due to a fall in plantation output of 23 per cent, for largely different reasons. There is apparent stagnation in smallholder production, but this is from 1982/83, output increasing since then by only 6 per cent over four years, a 1-1/2 per cent average annual increase compared with 9 per cent over the six years up to 1982/83. If we look over a slightly longer period the share of villages in the area under cocoa increased from 28.8 per cent in 1972/73 (Densley and Wheeler, 1978, Table 8) to practically double, 56.6 per cent in 1985.

Examination of performance by region (Table 4) reveals a much less impressive picture. Of the increase in smallholder production in the decade up to 1986/87, 62 per cent was accounted for by the North Solomons, and 92 per cent by North Solomons, East New Britain and East Sepik : in a good many provinces there was either a negligible increase in output or an actual decline. This is a disappointing performance if a recent Cocoa Board estimate is accepted (Scheu 1987b, p.83) that only 5 per cent of the soil suitable for cocoa production in Papua New Guinea is currently planted up. There has not yet been launched a frontal assault in the promotion of smallholder production of cocoa in Papua New Guinea. In most of the potential areas a "vicious circle" exists, as we shall see : lack of basic infrastructure and a developed system of marketing reduces incentives for growers to produce, while the restricted volume of production does not yield the throughput required to validate the development of the latter. Progress has been achieved during the decade in one province where comparatively little production existed in 1976/77 : East Sepik. It will be useful, therefore, to have selected this as an area for detailed study.

As expected, the distribution of cocoa fermentaries is equally concentrated (Table 5) : about 64 per cent of fermentaries and of fermentary-dealers are in the North Solomons, and 20 per cent of fermentaries (17 per cent of dealers) in East New Britain. Distribution is not directly in proportion to cocoa produced, however : East Sepik, for example, has a smaller number of fermentaries than might have been expected. As will be further explored this is not mere chance but the result of different policies and influences operating in each place.

Most of the large exporters have their head offices in Rabaul. The two main exit ports for cocoa are Rabaul (44 per cent) and Kieta (44 per cent), though some is exported also through Lae and Madang (Table 6). Hence cocoa from Wewak or Aitape or other smaller ports around the coast needs first to be transhipped to one of these four major ports. There are just three prominent exporters of which one, Angco, is dominant (Table 7).

Table 3
The growth of cocoa production in Papua New Guinea
1976-87

Year	Plantations (tonnes)	Other growers (tonnes)	Total (tonnes)	Share of plantations (per cent)	Share of other growers (per cent)
1976/77	13,622	12,954	26,576	51.3	48.7
1977/78	15,147	14,658	29,805	50.8	49.2
1978/79	13,283	16,843	30,126	44.1	55.9
1979/80	14,116	16,698	30,814	45.8	54.2
1980/81	12,047	16,082	28,129	42.8	57.2
1981/82	11,819	18,055	29,874	39.6	60.4
1982/83	9,345	20,056	29,401	31.8	68.2
1983/84	8,600	19,112	27,712	31.0	69.0
1984/85	9,617	21,170	30,787	29.4	70.6
1985/86	9,923	22,795	32,718	30.3	69.7
1986/87	10,463	21,283	31,747	33.0	67.0
Increase 1976-87 (tonnes)	-3,159	8,329	5,171	-	-
(per cent)	-23.2	64.3	19.5	-	-
Increase 1983-87 (tonnes)	1,118	1,227	2,346	-	-
(per cent)	12.0	6.1	8.0	-	-

Source: Cocoa Board of Papua New Guinea

Table 4
Cocoa production by province and sector, 1976/77 and 1986/87

	Production 1976/77			Production 1986/87			Increase in production 1976/77 to 1986/87			Provincial share of increase in production in non- plantation sector
	Plantations (1)	Other (2)	Total (3)	Plantations (4)	Other (5)	Total (6)	Plantations (4) - (1)	Other (5) - (2)	Total (6) - (3)	
East New Britain	5,196	5,153	10,349	3,680	6,219	9,899	-1,516	1,066	-450	12.8
North Solomons	4,912	6,154	11,066	4,104	11,303	15,407	-808	5,149	4,341	61.8
New Ireland	1,212	170	1,382	572	313	885	-640	143	-497	1.7
Madang	1,418	501	1,919	1,056	787	1,843	-362	286	-76	3.4
West New Britain	505	178	683	554	254	808	49	76	125	0.9
Morobe	131	96	227	139	91	230	8	-5	3	-0.1
East Sepik	-	181	181	1	1,694	1,695	1	1,513	1,514	18.2
West Sepik	-	-	-	-	129	129	-	129	129	1.5
Manus	21	7	28	-	80	80	-21	73	52	0.9
Northern (Oro)	162	494	656	205	399	604	43	-95	153	-1.1
Milne Bay	29	19	48	39	-	39	10	-19	-9	-0.2
Central	36	1	37	111	-	111	75	-1	74	..
Gulf	-	-	-	-	14	14	-	14	14	0.2
Total	13,622	12,954	26,576	10,463	21,283	31,747	-3,159	8,329	5,171	100.0
(per cent)	51.3	48.7	100	33.0	67.0	100	-23.2	+64.3	+19.5	-

Source: Cocoa Board of Papua New Guinea.

Table 5
Geographical distribution of cocoa fermentaries and dealers
May 1987

Province	Fermentaries		Dealers	
	No.	Per cent	No.	Per cent
North Solomons	1,525	64.5	838	63.5
East New Britain	476	20.1	226	17.1
(Gazelle)	(294)		(140)	
(Non-Gazelle)	(182)		(86)	
New Ireland	93	3.9	71	5.4
Madang	97	4.1	57	2.4
West New Britain	78	3.3	54	2.3
Northern	29	1.2	24	1.8
Morobe	25	1.1	16	1.2
Manus	21	0.9	14	1.1
Sepik provinces	15	0.6	14	1.1
Central	5	0.2	4	0.3
Milne Bay	1	..	1	0.1
Gulf	1	..	1	0.1
Total	2,366	100.0	1,320	100.0

Source: Cocoa Board of Papua New Guinea.

Table 6
Cocoa export by Papua New Guinea port, 1987

Port	Tonnes exported	Per cent
Rabaul (East New Britain)	15,107,557	44.0
Kieta (North Solomons)	15,080,710	44.0
Lae (Morobe)	2,464,687	7.2
Madang	1,463,453	4.3
Kimbe (West New Britain)	30,102	0.1
Wewak (East Sepik)	-	-
Oro Bay	150,000	0.4
Kavieng (New Ireland)	-	-
Total	34,296,509	100.0

Source: Cocoa Board of Papua New Guinea data.

Table 7

Exports of cocoa in 1987 by exporter and port of export

Exporter	Rabaul tonnes	%	Kieta tonnes	%	Iae tonnes	%	Madang tonnes	%	Kimbe tonnes	Oro Bay tonnes
Angco	10,167	60.0	8,258	59.9	1,594	70.2	1,472	74.3	-	-
New Guinea Cocoa	4,353	25.7	3,090	22.4	377	16.6	-	-	-	-
Rabtrud	2,256	13.3	1,954	14.2	300	13.2	510	25.7	20	-
Bougainville Marketing Cooperative	-	-	480	3.5	-	-	-	-	-	-
Itelek	180	1.1	-	-	-	-	-	-	-	-
New Guinea Plantations	440	-	1,420	-	-	-	-	-	-	50
North Solomons Plantation Development Corporation	-	-	318	-	-	-	-	-	-	-
Pacific Trading Co.	500	-	-	-	-	-	105	-	-	-
Total excluding plantations	16,956	100	13,782	100	2,271	100	1,982	100	20	50

Source: Cocoa Board of Papua New Guinea.

Chapter 3

THE DEVELOPMENT OF COPRA PRODUCTION IN PAPUA NEW GUINEA

Copra production in Papua New Guinea was expanding quite rapidly in the 1970s, there occurring a full 30 per cent increase, for example, between 1976 and 1979 (Table 8), with big increases in East New Britain, Madang and North Solomons. Between 1979 and 1986 aggregate output was stagnant, actually falling by one per cent. This aggregate change, however, disguises large falls in East New Britain and Central, Gulf, Western and Milne Bay provinces which have been offset by continued growth (nearly doubling output) in West New Britain. During this period marketing board purchase prices fluctuated widely (Table 9), moving from K152 per ton in 1976 (smoke grade) to K301 in 1979, down to K170 in 1982, up to K385 in 1984, and finally K200 in 1987, these fluctuations being more important than any change in trend. In anticipation of the next section, on the economic responsiveness to price of copra producers, such fluctuations would make appropriate response quite difficult for growers to gauge.

Village production of copra accounts for rather more than 60 per cent of the total (Table 10), though the production varies between provinces to some degree. However, East New Britain is the leading province in terms of both plantation and village production, New Ireland, North Solomons, Madang and West New Britain also being important in both cases. It follows that, while those provinces which are dominant in cocoa production are also among the important copra producing areas copra incomes are considerably more widely distributed geographically within Papua New Guinea than cocoa.

Table 8

The production of copra 1976 - 1986, by province

Province	Depot	Output		1986	Change in output			
		1976 (tonnes)	1979 (tonnes)		1976-86 (tonnes)	1979-86 (tonnes)		
East New Britain	Rabaul/Toboi	43,771	57,311	50,438	31.8	6,667	18.9	-6,873
East New Britain	CPL own estates	5,574	5,309	5,105	3.2	-469	-1.3	-204
Madang	Madang	19,029	24,045	25,618	16.2	6,589	18.7	1,573
North Solomons	Kieta	10,210	14,801	16,039	10.1	5,829	16.5	1,238
North Solomons	Buka	7,588	9,736	9,795	6.2	2,207	6.3	59
New Ireland	Kavieng/ Namatanai	15,198	18,894	17,765	11.2	2,567	7.3	-1,129
West New Britain	Kimbe/Kandrian	4,995	7,449	14,615	9.2	9,620	27.3	7,166
Milne Bay	Alotau/Samarai	4,939	7,511	7,714	4.9	2,775	7.9	-203
Central/Gulf/ Western/Milne Bay	Port Moresby	7,201	7,455	4,000	2.5	-3,201	-9.1	-3,455
Morobe/Oro	Iae/Finschhafen	1,774	2,860	3,587	2.3	1,813	5.1	727
East & West Sepik/Manus	Wewak	1,752	3,071	3,059	1.9	1,307	3.7	-12
Manus	Lombrum/Lorengau	1,221	1,694	757	0.5	-464	-1.3	-937
Total		123,252	160,136	158,492	100.0	35,240	100.0	-1,644

Source: Copra Marketing Board of Papua New Guinea

Table 9
Copra Marketing Board purchase prices for
fair merchantable standard and smoke grade copra,
1976-1988

Year	Fair merchantable standard (K/tonne)	Smoke grade (K/tonne)	Difference (K/tonne)
1976	176	152	24
1977	244	218	26
1978	255	222	33
1979	346	301	45
1980	250	232	18
1981	224	208	16
1982	172	170	2
1983	240	236	4
1984	387	385	2
1985	310	303	7
1986	212	213	0
1987	202	200	2
1988	229	227	2

Source: Copra Marketing Board of Papua New Guinea.

Table 10
Share of village and plantation production of copra
by province, 1985

Province	Total		Plantations		Village		Proportion village in total
	(t)	(%)	(t)	(%)	(t)	(%)	(%)
East New Britain	47,810	33.4	16,838	31.2	30,927	34.6	65
New Ireland	21,340	14.9	6,717	12.5	14,623	16.4	69
North Solomons	20,928	14.6	9,181	17.0	11,747	13.1	56
Madang	17,775	12.4	10,286	33.0	7,489	8.4	42
West New Britain	16,726	11.7	6,073	11.3	10,653	11.9	64
Milne Bay	6,491	4.5	848	1.6	5,643	6.3	87
Central	3,314	2.3	2,585	4.8	729	0.8	22
Morobe	2,713	1.9	684	1.3	2,029	2.3	75
Manus	2,043	1.4	262	0.5	1,781	2.0	87
Gulf	1,923	1.3	285	0.5	1,638	1.8	85
East Sepik	1,437	1.0	62	0.1	1,375	1.5	96
West Sepik	486	0.3	43	0.1	443	0.5	91
Oro	266	0.2	32	0.1	234	0.3	88
Western	29	..	7	..	22	..	76
Total							
(DAL statistic)	143,281	100.0	53,903	100.0	89,378	100.0	62
Total							
(CMB statistic)	170,538						

Note: Figures exclude own production of Coconut Products Limited (CPL).
Department of Agriculture and Livestock (DAL) figures do not tally with
Copra Marketing Board (CMB) total.

Source: Department of Agriculture and Livestock, Produce Inspection Section.

Chapter 4

THE SUPPLY RESPONSIVENESS AND ECONOMIC RATIONALITY OF GROWERS

In many developing countries the view is taken by administrators and policy-makers that villagers or smallholders are lacking in responsiveness to economic opportunity. Such a view often directly affects the agricultural development strategy adopted, usually favouring "transformation" schemes of one kind or another.

In Papua New Guinea a distinction is sometimes drawn between different groups, coastal and non-coastal, which is misleading in not taking account of differences in the opportunities available in the two regions. Thus a recent study stated :

"A Highlands Big Man, for example, with his ceaseless search for property and wealth for conversion into status which in itself leads to further opportunities for property and wealth, is an actor who would fit easily into many classical transport/development planning models. However, there are groups in Papua New Guinea who show little interest in cash income and little propensity to invest or develop resources, even though opportunities may be available. Such groups have been little exposed to a cash economy and when exposed have reacted defensively or have failed to develop the institutions and skills necessary to take advantage of a cash economy : mobility, productivity, specialisation and division of labour, exchange of surplus to satisfy need, etc."

(Ministry of Transport, Rural Transport Study, 1981).

It is important not to confuse lack of infrastructural development, however, with lack of economic motivation among villagers in the areas concerned. The rapid growth of village cocoa production described earlier demonstrates this. In the case of copra Landell-Mills (1986), analysing Copra Marketing Board receivals over an eight-month period in 1983, found strong positive response to price. Following the substantial price decline from high levels in 1985 Jackman (1987, p.21) reported that in the first five months of 1987 just 20,424 growers out of 52,061 registered with the Board were active, 39 per cent, compared with 32,780 or 63 per cent in the preceding year, 1986.

While there is already fairly clear evidence of economic responsiveness, it was nevertheless considered worthwhile including a number of related questions in our own rural survey. Villagers were asked, first, to identify their most urgent cash needs (Table 11). The most frequently mentioned items were, in order, consumer goods, food, farm inputs, and school fees, followed by medical expenses. There was an obvious range of demands for which cash incomes were required. Apart from farm inputs, the items specified were mostly consumer items. Cash with which to hire labour was not mentioned here, though noted elsewhere as a major constraint.

We have not attempted to calculate supply elasticities of growers using econometrics. If growers in Papua New Guinea can be shown to be generally responsive to price, as in other countries, there is a vast amount of empirical work on supply elasticities of peasant producers in these countries which would suggest the existence of similarly positive responses here. (Sepik) growers were asked the general

question, were they harvesting all their cocoa and copra (Table 12), 68 per cent saying yes in the case of cocoa and 17 per cent - only - saying yes in the case of copra. The fact that 83 per cent of growers were not harvesting all their copra, and the contrast between these two crops, no doubt reflects a direct response to the current low price of copra though, as we shall see presently, other factors militate specifically against the marketing of copra. The percentage not marketing all their copra is highest in the more inaccessible parts of West Sepik. What is surprising, perhaps, is that the proportion not harvesting all their cocoa is as high as it is. In answer to the specific question, would the grower harvest more if the price were higher, the larger majority of cocoa and copra growers (Table 13) replied that they would. This was true also of the willingness to plant more cocoa and coconut (copra) (Table 14).

Growers were also asked to specify the most important reasons for their not selling more cocoa or copra (Table 15). The major causes are evidently, in order of importance, (1) price; (2) transport problems - as will be elaborated presently; (3) labour constraints - in the case of both cocoa and copra; (4) processing difficulties, in the case of copra; (5) crop diseases, particularly affecting cocoa, and this especially in East New Britain, but also affecting copra in East New Britain; and (6) a land constraint, affecting cocoa especially.

Table 11
Most urgent cash needs as identified by villagers

Item	No. of times mentioned*	Per cent
Food	231	18.0
Drink	82	6.4
Consumer goods	257	20.0
Farm inputs	220	17.1
School fees	201	15.7
Medical expenses	117	9.1
(House) building materials	47	3.7
Savings	42	3.3
Purchase of vehicles/boat	21	1.6
Agricultural development	16	1.2
Customary assistance	10	0.8
Business activity	8	0.6
Bride price	7	0.5
Loan repayment, tax	4	0.3
Own fermentary	3	0.2
Other	17	1.3
Total	1,283	100.0

Note: * Individuals not limited in their number of choices of felt needs.

Table 12
Is the grower harvesting all his cocoa/copra?

	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	%
Cocoa							
Yes	-	49	63	27	28	167	68.2
No	-	33	19	10	16	78	31.8
Not answered ¹	-	6	17	2	16	41	-
Copra							
Yes	-	13	15	1	1	30	16.8
No	-	49	70	19	10	148	83.1
Not answered ¹	-	26	14	19	49	108	-

Note: 1. Includes growers not growing the crop in question.

Table 13
Would the grower harvest more if the price were higher?

		East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	%
Yes	cocoa	68	79	58	21	30	256	95.2
	copra	54	61	81	9	10	215	93.1
No	cocoa	6	1	2	3	1	13	4.8
	copra	5	0	2	6	3	16	6.9
Not answered¹	cocoa	3	8	39	15	30	95	-
	copra	10	27	16	24	46	123	-

Note: 1. Includes those not growing coconuts/copra.

Table 14
Would you consider planting more cocoa/copra
if the price were higher?

	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.
Cocoa					
Yes	80	64	27	40	211
No	0	0	2	1	3
Not answered ¹	7	34	10	18	69
Copra (coconuts)					
Yes	60	61	11	11	143
No	0	13	2	6	21
Not answered ¹	26	24	26	41	117

Note: 1. Includes those not growing the crop in question.

Table 15

Most important reasons for growers not selling more

	East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik far west	Total
Price	67 52	83 63	56 81	21 8	30 11	257 215
Price instability	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	0 2	1 0	0 0	0 0	0 0	1 2
Non-payment of dividends	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	0 0	5 0	0 0	0 0	0 0	5 0
Transport problems	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	39 36	42 50	36 65	19 5	29 8	165 164
Labour constraint	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	39 28	30 26	18 21	5 0	9 4	101 79
Cost of hired labour	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	0 0	0 0	4 1	1 0	4 0	9 1
Land constraint	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	24 17	10 7	6 9	8 2	9 4	57 39
Dispersed landholding	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	0 0	0 0	1 1	0 0	1 0	2 1
Processing difficulties	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	7 29	5 34	3 36	3 13	4 5	22 117
Crop diseases	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra	cocoa copra
	41 27	12 0	2 0	13 0	1 1	69 28

Table 15 (continued)

Most important reasons for growers not selling more

		East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik Far west	Total
Shortage of chemicals	cocoa copra	0 0	2 0	0 0	0 0	0 0	2 0
Lack of D.A.L. assistance in spraying	cocoa copra	1 0	0 0	0 0	1 0	0 0	2 0
Lack of money for fertilisers, pesticides	cocoa copra	1 0	0 0	0 0	0 0	0 0	1 0
Financial constraints	cocoa copra	1 1	0 0	2 0	0 0	0 0	3 1
Lack of seedlings	cocoa copra	1 0	0 0	2 0	0 0	0 0	3 0
Inadequate extension service	cocoa copra	1 0	0 0	1 1	0 0	2 1	4 2
Poor soil	cocoa copra	0 0	1 1	0 0	0 0	0 0	1 1
Security problems	cocoa copra	1 0	1 0	0 0	0 0	0 0	2 0
Not answered	cocoa copra	5 18	5 26	32 14	7 22	18 46	67 126

Chapter 5

THE LACK OF BULK-BUILDING IN THE EXPORT MARKETING SYSTEM

A remarkable feature of the marketing system in Papua New Guinea is the absence of "bulk-building". In the usual case growers sell first to primary buyers, perhaps even to itinerant traders buying directly at the farm gate; the primary buyers in turn sell to wholesale buyers, who then sell to exporters. At each point produce is bulked, so that economies of scale are achieved in the transshipment of produce. In Papua New Guinea growers in a large proportion of cases appear to accompany their produce to sell it directly themselves to dealers located in the port of export or, in the case of copra, to sell it at the Copra Marketing Board depot.

With cocoa there are major advantages in transporting dry bean, after processing, rather than wet beans which weigh about three times the equivalent dry bean value. Hence in the developed cocoa regions such as the Gazelle in East New Britain a large number of small fermentaries have sprung up and plantations all have their own fermentaries and ship dry bean. In order to buy other people's wet beans plantations or growers with their own fermentaries need to have a dealer's licence. However, under Cocoa Board regulations no secondary trading in dry bean is allowed: each fermentary, with or without a dealer's licence, must deliver its own dry bean to the exporting company itself, irrespective of distance. As a result even in the movement of dry bean, bulk-building is limited. Thus in the Gazelle area of East New Britain 69 per cent of fermentaries without dealers' licences shipped annual totals during 1987 of less than 50 bags (Table 16). In the same period, in East New Britain as a whole, 50 per cent of annual shipments from fermentaries and fermentary-dealers were of less than 50 bags. The corresponding figure for all plantations was just under 18 per cent. This implies very much smaller individual shipments during the year, of course: 52 per cent of individual consignments from fermentaries and fermentary-dealers in 1987 in East New Britain as a whole were of five bags or less (Table 17), each delivered directly to the exporter (in 1987 via the Cocoa Board Produce Inspection point). The median size of consignment was 7-1/2 bags, seven bags for fermentary-dealers, three bags for fermentaries without dealer licences and 19-1/2 bags for plantations. The effect of bulking is reflected in this difference in the average size of shipment made by a fermentary owner and a fermentary-dealer, who bulks the produce of others. On an annual basis the median amounts delivered by these in East New Britain were 26 bags and 80 bags respectively: though even the amount achieved by the latter is small relative to the median shipment of 350 bags achieved by plantation-owners and the amounts well in excess of 2,000 bags achieved by the biggest of these.

It is worth comparing these figures with some for East and West Sepik (Table 18). The median annual amount supplied is 23 bags, compared with 62 in East New Britain. In West Sepik it is just 11 bags, reflecting the still embryonic state of cocoa production there.

It should be stressed that the sizes of consignment discussed above were of dry bean from fermentary to exporter. Information on the average size of consignments of wet bean from grower to fermentary is given in the next section. The effect of moving large numbers of small, unbulked lots is, of course, to raise transport and other handling costs considerably.

The lack of bulk-building is just as evident in the case of copra, although the nature of the product makes this somewhat less problematic. Copra is bulkier in relation to value than cocoa wet bean and in addition can be stored with less difficulty by individual growers to give themselves the bulk of 7-14 bags to fill or half-fill a pick-up hired for the purpose. Against this there does not exist the equivalent of the fermentary-dealer, as in the case of cocoa, to provide at least one important element of bulk-building. Thus in 1979/80 in East New Britain three-quarters of initial sales of copra were directly to the Copra Marketing Board (CMB) depot in Rabaul, and only 17 per cent to traders (Table 19). In Kokopo and Rabaul districts only 9-13 per cent of the product passed through traders. The three largest traders handling copra accounted for less than 11 per cent of deliveries to CMB in 1987 (Table 20). This is despite the fact that the median size of annual deliveries by growers and suppliers other than plantations in East New Britain in 1987 was just 32 bags (Table 21). This compares with 2,333 bags for plantations, indicating a very different scope for achieving economies through bulk deliveries. For individual consignments, again excluding plantations, the median size in 1987 was 7-1/2 bags, compared with 76 bags for plantations. This is not too small, compared with the 14 bags (one tonne) needed to fill a pick-up, though it should be remembered that East New Britain is the area of greatest concentration of copra production in Papua New Guinea (Table 8). In Wewak the median delivery was of 8.3 bags per annum (Table 23) and for monthly deliveries by growers just 5 bags (Table 24).

The situation described appears typical of Papua New Guinea. In a sample of copra producers on Karkar Island (Landell-Mills 1986) 62 per cent (53 out of 70) sold directly to the marketing board, 17 per cent (12 producers) sold to plantations, and 22 per cent (15 producers) sold to both. The author comments that "transport cost to the CMB depot was consistently the largest cost item for most smallholders!"

Table 16
Total amounts of dry cocoa delivered for export during 1987 by plantations,
fermentaries and dealers in East New Britain, by size

Annual amount delivered (bags)	1-9	10-24	25-49	50-99	100-199	200-299	300-399	400-499	500-999	1000- 1999	2000- 3999	4000- 9999	10,000 & over	Total
Plantations and plantation dealers	No. 2	8	3	5	8	9	4 (median = 350)	4	14	8	6	3	-	74
Fermentaries, Gazelle	No. 15 (%) 43.3	30	27	18	8	3	2 (median = 31)	1	-	-	-	-	-	104 (100)
Fermentary-dealers, Gazelle	No. 14 (%) 33.3	14	16	19	35	11	5 (median = 108)	6	4	2	1	2	3	132 (100)
Fermentaries, non-Gazelle	No. 19 (%) 57.0	26	17	16	1	-	- (median = 21)	-	-	-	-	-	-	79 (100)
Fermentary-dealers, non-Gazelle	No. 4 (%) 29.5	7	15	31	16	6	5 (median = 62)	1	1	2	-	-	-	88 (100)
All fermentaries	No. 34 (%) 49.2	56	44	34	9	3	2 (median = 26)	1	-	-	-	-	-	183 (100)
All fermentary- dealers	No. 18 (%) 31.8	21	31	50	51	17	10 (median = 80)	7	5	4	1	2	3	220 (100)
All suppliers	No. 54 (%) 45.5	85	78	89	68	29	16 (median = 62)	12	19	12	7	5	3	477 (100)

Table 17
Size distribution of individual consignments of dry cocoa delivered for export
in 1987 by plantations, fermentaries and dealers in East New Britain

Size of deliveries (bags)	1-2	3-5	6-9	10-14	15-19	20-39	40-59	60-79	80-99	100- 119	120- 149	150- 199	200- 500	Total
Plantation and plantation dealers (%)	157 (16.2)	196 (16.2)	267	259	220	475 (median = 19.4)	356	84	59	69	20	19	4	2185 (100)
Fermentaries, Gazelle (%)	525 (75.7)	344 (75.7)	158	64	29	24 (median = 2.9)	3	-	-	-	-	-	1	1148 (100)
Fermentary-dealers, Gazelle (%)	589 (57.2)	643 (57.2)	425	322	169	147 (median = 7.5)	69	94	179	208	13	27	10	2895 (100)
Fermentaries, non-Gazelle (%)	205 (71.9)	155 (71.9)	81	32	16	11 (median = 3.4)	-	-	1	-	-	-	-	501 (100)
Fermentary-dealers, non-Gazelle (%)	222 (65.9)	343 (65.9)	264	186	120	87 (median = 6.5)	30	2	2	1	1	-	-	1258 (100)
All fermentaries (%)	730 (74.5)	499 (74.5)	239	96	45	35 (median = 3.1)	3	-	1	-	-	-	1	1649 (100)
All fermentary- dealers (%)	811 (59.9)	986 (59.9)	689	508	289	234 (median = 7.1)	99	96	181	209	14	27	10	4153 (100)
All consignments (%)	1698 (42.3)	1681 (42.3)	1195 (25.8)	863	554	774 (median = 7.6)	458	180	241	278	34	46	15	7987 (100)

Table 18
Size distribution of deliveries of cocoa from
fermentaries, 1987, West and East Sepik

Amount delivered (No. bags)	East Sepik	West Sepik		Total West Sepik	Total East and West Sepik		
		excluding plantation/ dealer	plantation/ dealer		No.	(%)	
1-2	6	7	1	8	14	5.1	} 21.4
3-5	6	13	1	14	20	7.2	
6-9	11	14	-	14	25	9.1	
10-15	35	10	1	11	46	16.7	
16-24	37	5	-	5	42	15.2	
25-39	32	6	-	6	38	13.8	
40-59	17	1	8	9	26	9.4	
60-79	14	-	10	10	24	8.7	
80-99	11	-	2	2	13	4.7	
100-119	22	-	-	-	22	8.0	
120-149	1	-	-	-	1	0.4	
150-199	1	-	-	-	1	0.4	
200-249	2	-	-	-	2	0.7	
250-299	-	-	-	-	-	-	
300-399	1	-	-	-	1	0.4	
400-499	1	-	-	-	1	0.4	
Total	197	56	23	79	276	100.0	

Source: Cocoa Board of Papua New Guinea data.

Table 19
East New Britain : marketing outlets for copra,
1979/80

District	Outlet for initial sale (per cent share)			
	CMB depot Rabaul	Traders	Plantations	Others
Kokopo	86	13	1	-
Rabaul	86	9	5	-
Keravat	-	50	50	-
Pomio	55	27	6	12
East New Britain	75	17	3	5

Source: Department of Agriculture and Livestock, Rural Statistics Bulletin,
July 1983

Table 20
Copra : deliveries by leading traders and business groups as a proportion
of total deliveries to CMB depot, East New Britain, 1987

Trader	Quantity delivered	
	(kgs)	(per cent)
Malaguna Trading Co.	1,977,760	4.1
Toluvia Trading Co.	1,817,110	3.7
Nonga Trading Co.	1,384,780	2.9
Ulavea Business Group	464,760	1.0
New Guinea Island Produce Co.	282,810	0.6
Kulube Sh. Cooperative	88,003	0.2
Papadu Holding Pty. Ltd.	80,300	0.2
Burmah Trading Co.	50,140	0.1
Total deliveries to CMB	48,498,291	100.0

Source: Copra Marketing Board of Papua New Guinea, raw data.

Table 21
Copra : annual quantities delivered by growers,
East New Britain, 1987

Quantity delivered (kgs)	No. of growers including traders	Number of plantations
1 - 149	5	-
150 -	121	-
300 -	312	-
500 -	722	-
1000 -	934	1
2000 -	516	1
3000 -	663	3
5000 -	604	3
10,000 -	363	6
30,000 -	24	5
50,000 -	17	10
100,000 -	3	13
150,000 -	3	9
200,000 -	4	29
500,000 -	1	6
1,000,000 -	1	3
1,500,000 - 2,000,000	2	-
Total no. of suppliers	4,485	89
Median quantity supplied	2,291 (32 bags)	166,667 (2,333 bags)

Source: Copra Marketing Board of Papua New Guinea, raw data.

Table 22
Copra : size of individual deliveries made by growers,
East New Britain, December 1987

Size of consignment (kgs)	No. of individuals, groups and traders No. (per cent)		Number of plantations
1 - 149	16	47.2	-
150 -	496		1
300 -	1,205		-
500 -	1,435	39.4	6
1000 -	310	13.4	25
2000 -	49		32
3000 -	72		68
5000 -	57		134
10,000 - 29,999	-		19
Total no. of suppliers	3,640	100.0	285
Median quantity supplied	536 (7-1/2 bags)		5,410 (76 bags)

Source: Copra Marketing Board of Papua New Guinea, raw data.

Table 23
Annual deliveries by copra growers to
Copra Marketing Board depot, Wewak, 1987

Amounts delivered (kgs)	By individuals	By associations, societies & business groups	By plantations	Total No.	Cum. %
1 - 149	34	2	-	36	2.9
150 -	96	5	-	101	11.1
300 -	131	1	-	132	21.9
500 -	276	8	-	284	45.0
1000 -	317	8	-	325	71.4
2000 -	143	5	-	148	83.4
3000 -	115	3	1	119	93.1
5000 -	51	2	-	53	97.4
10,000 -	21	5	-	26	99.5
30,000 -	1	1	1	3	99.8
50,000 -	-	-	2	2	99.9
100,000 - 299,000	-	-	1	1	100.0
Total	1,185	40	5	1,230	
Median (kgs)				595	(8.3 bags)

Source: Copra Marketing Board of Papua New Guinea, computer file.

Table 24
Size of monthly deliveries by growers to
Copra Marketing Board depot, Wewak, 1987

Size of consignment (kgs)	Number of deliveries	Proportion of deliveries (per cent)
1 - 149	915	16.1
150 -	1,448	25.6
		41.7
300 -	1,478	26.1
500 -	1,351	23.8
1000 -	358	6.3
2000 -	46	0.8
3000 -	26	0.5
5000 -	41	0.7
10,000 - 29,999	3	0.1
Total	5,666	100.0
Median (kgs)	364 (5 bags)	

Source: Copra Marketing Board of Papua New Guinea, computer file.

Chapter 6

TRANSPORT COSTS FOR LOCAL MOVEMENT OF COCOA AND COPRA

The rural survey carried out was able to establish from villagers and from interviewed transporters and shippers the prevalent transport rates for cocoa wet bean and copra for different locations within East New Britain and East and West Sepik (Tables 25 and 26). Given the undeveloped road network in Papua New Guinea as a whole, it is reasonable to suppose that transport charges are likely to be significant and to affect considerably the net price payable to the grower in different places. Net grower prices are therefore calculated in the tables. Given the lack of bulk-building which is a feature of the marketing of both crops, and the fact that many growers sell their crops in very small lots, these prices are calculated separately for representative consignments revealed by the surveys and for a smaller unit, taken to represent commonly despatched small consignments. The quantities selected were 75 kilograms (3 bags) and 25 kilograms (one bag) for cocoa wet beans and 6 bags (14 bags equals one tonne) and 2 bags for copra. The range of actual consignments for a number of different locations is given (Table 27), also with transport cost calculations, but it is more useful to compare the effect of different locations and transport situations on a standard set of consignments as in the first tables.

An interesting feature within the Gazelle Peninsula is that a standard 10 per cent charge is made for transporting cocoa beans (Table 25). Some variation exists between transporters and in some cases also a 20 per cent charge is made for cocoa being carried from rather further away. For the most part the first rate appears to be adhered to, no different payment being made whether the cocoa is collected in Vunadidir, 20 kilometres from Rabaul, or Vunga, more than 50 kilometres away : indeed, the same charge is made, and accepted, for distances of only one or two kilometres. A feature of the system in the Gazelle is that the dealer himself divides the payment for the wet beans between grower and transporter, in line with the 10 per cent rule. Although in some instances of longer distance the transporter is able to make a case to the dealer for a larger percentage of 15 or 20, which the grower may accept, this rule appears to have become well established over a period of time such that it can now be applied in a semi-automatic way without debate. Passenger rates have also become fairly well established though are probably more directly the outcome of competition than of custom. The result of the fixed percentage is in effect to subsidise growers further from Rabaul and to penalise those within closer reach.

In East and West Sepik, to see if the practice were prevalent there also, villagers were asked if they or the buyer generally paid the transporter. The responses (Table 28) may reflect some degree of confusion where, for example, roadside buying was the norm in certain areas. However, in the case of copra it is quite clearly the grower who makes the payment in virtually all cases, while responses were fairly evenly divided in the case of cocoa.

A feature which facilitates export crop marketing in the Gazelle is that the road network is excellent, though confined to only a portion of the Peninsula, while, given the relative cash richness of the local economy, there is a frequent, fast service of public motor vehicles (PMVs). As a result, even though, as elsewhere, lack of bulk-building means that growers deliver their own cocoa and copra to the export point,

Rabaul in this case, raising transportation costs, they are able to retain, net of these costs, a substantial proportion of the Rabaul dealers' price. This was 84 per cent in the case assumed of a representative 3-bag consignment. Even here, though, we see the effect of transporting a very small consignment of 25 kilograms (one bag), as is commonly done : the net grower price falls immediately from 84 to 73 per cent of the base price.

The situation with respect to the offshore islands is also observable (Table 25, next section). Despite their close proximity to Rabaul, particularly in the case of Watom Island, which can be easily observed from Rabaul across a narrow stretch of water, the net grower price falls to 72 per cent for a standard consignment, and 48 per cent for a small consignment, less than half the price payable for the same wet beans in Rabaul. The charges from the Duke of York Islands reduce the net grower price to 51 per cent, and just 4 per cent for the smaller quantity.

If we go beyond the developed north-east portion of the Gazelle Peninsula to the south coast, places such as Wide Bay, Pomio and beyond, even for standard 3-bag consignments all net grower prices are negative, and substantially so. This can be seen to be due to the passenger fare element, and it is therefore the practice of accompanying the consignment to the export point, in contrast to local sale to a primary buyer within a bulk-building system, which makes production for the grower uneconomic. The position for north coast sales from Lassul and beyond to the west is similar. Any solution would need to operate to substantially reduce the passenger fare element. Already in some cases dealers are willing to collect wet beans delivered to the wharf at Rabaul, obviating these costs. A development of this would be purchase of wet beans by a primary buyer, bulk-building in Pomio and other small centres, and despatch to Rabaul. Preference would be for a small fermentary and transport of cocoa as dry bean. In the absence of a sufficient volume of produce to induce entry by a local buyer, assistance by the extension service in organising despatch on a periodic basis by groups of growers could justifiably be provided so long as local production remains embryonic.

In making the calculations for East and West Sepik, an adjustment was made to the reference prices at Rabaul of 46 toea per kilogram for cocoa wet beans and K210 per tonne (K15 per bag) for copra to take account of the costs of shipment to an equivalent exporting port. Cocoa from Wewak, Aitape or Vanimo would generally go to Lae (or Madang) for international export, at total costs including warehousing of respectively K48/30, K47/55 and K43/55 a tonne, which suggests an approximate differential of 4 toea per kilogram from the Rabaul price at these ports. Copra is also transhipped to Lae for export at a cost of about K45 per tonne, from either Wewak or Aitape, equivalent to K3.21 per bag. However, since the Copra Marketing Board have a sub-depot at Wewak, and pay a uniform Papua New Guinea price at all depots, irrespective of the different shipping costs it may incur, only copra delivered to Aitape is discounted in the calculations.

The figures for cocoa in East and West Sepik show clearly the importance of transport costs. These fall to 62 per cent of the Rabaul price for Karawop and Boiken, and just 28 per cent for Swain. The net grower price in Swain is below 13 toea per kilogram, a deficit of 33 toea on Rabaul, of which only four is estimated here to reflect shipping costs beyond Wewak. For small consignments, again, the net grower price is 39 per cent of the Rabaul figure at Karawop, only 44 kilometres from Wewak, just 18 toea per kilogram, and is negative at Swain, some 93 kilometres from Wewak, the passenger fare element associated with the absence of any bulk-building in the marketing system again being very important.

The more fundamental observation which may be made is that a net grower price of some 13 toea per kilogram as at Swain offers a very low level of incentive to growers and must constitute a major obstacle to production for the market. The fact that a proportion of growers are willing, nonetheless, to grow cocoa no doubt reflects the absence of alternative opportunities with which to satisfy cash demands. Transport costs and marketing arrangements in turn exert a quantitatively large influence on the incentive offered to the grower relative to other factors.

If we pass further west along the Sepik coast, we find the percentage net grower price quite high at such places as Siaute (80 per cent) and Mallol (76 per cent). The explanation is that these are within comparatively easy reach of Aitape. Although this does not offer direct international export, so that produce for export, as from Wewak, needs to be transferred first to Lae or Madang, the cost of this movement by sea in bulk shipment is not large relative to the cost of overland transportation in small consignments.

The implication is that remoteness, in the specific sense of distance from Rabaul, Lae or Port Moresby, need not be a major handicap so long as the grower is within relatively easy reach of a subsidiary port such as Aitape or Vanimo where produce can be bulked and transferred to a major port for ultimate export. The most seriously handicapped growers are those at Swain, half way between Wewak and Aitape. The net grower price at Waramo not far from the West Irian border, on the other hand, would not be far below that at Vunadidir, just outside Rabaul, even without Department of Agriculture and Livestock (DAL) support. This suggests that it is not in principle too difficult to develop cocoa and copra around the perimeter of Papua New Guinea, away from the present areas of concentration, in enclave areas surrounding subsidiary ports, if marketing arrangements are adequately made for the collection and despatch of produce at those points. While the returns available from handling cocoa may be sufficient to generate adequate private sector arrangements, this is less certain in the case of copra, where the policy of the Copra Marketing Board has been to limit the number of depots and sub-depots. Evacuation of produce from Aitape - and this may be a situation replicated elsewhere - depends very largely on the performance of one predominant private trader who may perhaps be said to have shown less interest in copra than in cocoa. Where volume is low, as in this case, it makes sense to use established private traders as Copra Marketing Board agents rather than to establish new facilities which may not be economic. It is important, however, that the effectiveness of the agency should be directly monitored by the Copra Marketing Board as its direct concern.

The most surprising aspect of shipment from Warapu and Sissano is that growers attempt to sell any cocoa at all. One way of reaching the point of sale at Aitape is by motorised boat along the coast by sea, involving a substantial passenger charge if accompanied. This reduces net grower price to 19 toea per kilogram (42 per cent) for a standard consignment. An alternative method which is used to produce some economies is to go by motorised canoe, a one-hour trip by lagoon, followed by a three mile trip by mission-owned tractor on a muddy track, a wade across a substantial river to Mallol, and then a final ride by PMV to Aitape. Growers in the area do appear willing to go to these substantial lengths to sell cocoa as still the best means, for those who have any cocoa trees, of obtaining cash.

As in the case of parts of the south coast of East New Britain, discussed above, it is possible to economise on passenger charges by sending consignments unaccompanied, in this case under the charge of the boat owner himself or a friend or relative, or to carry cocoa in the course of a visit to town for another purpose. Such possibilities are

generally valid only for relatively small quantities and are not strictly relevant if we are concerned with a potential situation of developed cocoa production involving significant, regular volumes of marketed cocoa.

Finally with respect to cocoa, we may note the impact of roadside buying. This is practised over a substantial portion of East Sepik. As calculated, this provides growers at such places as Lowan and Kauk with as much as 87 per cent of the Rabaul price compared with only 62 per cent at Karawop, much closer to Wewak, where growers carry their own produce for sale. It is reasonable to take 40 toea per kilogram, the price paid by the predominant buyer in the area, the Sepik Cocoa Growers Association, as that obtaining for growers. Different explanations are possible for the divergence. Sepik Growers, and others, may be paying too much in relation to their costs, and thus effectively subsidising the grower to this extent, or the ability to pay a higher price may reflect the reduction in costs achieved under roadside buying through bulk-building in comparison with the relatively high-cost system of PMVs, including passenger costs and small consignments; or there may be a combination of both. The difference in effective price to the grower, 40 toea per kilogram compared with 29 toea at Karawop and 13 toea at Swain, is remarkable however. Roadside buying has another major advantage for growers - it does not penalise small lots : given that roadside buying involves bulk-building at the village level, no penalty would be necessary.

The same price was currently paid by the Department of Primary Industry (DPI) in its operations out of Vanimo, even some distance inland along the Ossima Road, despite the diseconomies of low volume of cocoa handled, clearly involving a substantial subsidy, though undertaken here for developmental purposes.

If we review now the corresponding information for copra (Table 26) we find a generally similar pattern, though the penalty for "small" consignments is much lower, because growers generally send at least two bags of dried copra at a time. There is no roadside buying of copra in East Sepik so that producers at Balam, Kauk and Sowan no longer obtain very advantageous prices relative to those at Karawop or Swain. In those areas involving substantial accompanying passenger charges, along the south coast of East New Britain and in West Sepik, the representative consignment of six bags of copra, being worth some K70-90 compared with about K35 for three bags (75 kilograms) of cocoa wet beans, is more able to support these charges, indicating the benefit of even this minimal extent of bulk-building.

As mentioned previously, Table 27 gives an indication of the actual sizes of consignments shown in the sample from the various locations, together with the implied net grower prices. This corresponds closely to the previous tables, confirming that six bags of copra and 75 kilograms of cocoa wet bean are representative of deliveries as a whole, together with two bags and 25 kilograms as common small consignments. The difference is that for some locations, generally those in West Sepik, where the production of cocoa is still embryonic, most actual consignments are very small, and the small lot of one bag of cocoa, some 25 kilograms, is the representative size.

As mentioned in the introduction, the Copra Marketing Board, unlike the Cocoa Industry Board, does involve itself in the direct handling of the product, but only that which is delivered for export at any one of its thirteen depots and sub-depots located around Papua New Guinea. It is not concerned with the efficiency with which copra reaches these destinations and, indeed, it is assumed that delivery to the depots does

not constitute a problem. A leading official of the Board expressed the view that the problem of transport was covered by the extended family system under which those without their own means of transport would get the necessary assistance through their relatives or friends within the village. We have seen, in fact, that (a) transport is viewed by growers as one of the principal problems which they face, in collecting firewood as well as selling produce, and (b) that transport costs absorb a substantial portion, very often of gross payments to growers, substantially reducing the net grower price. There is a particular problem, (c), affecting copra production in the outlying islands, with deleterious effects on the state of the product and the incentive to produce. Because of the suggestion that the matter was covered by the extended family system villagers were specifically asked whether they paid for the transport of produce to the selling point (Table 29). In the case of cocoa most people did except, obviously, where they sold through roadside buyers coming to the village. In the case of copra, where roadside buying is not practised, 97 per cent of respondents paid for transport. In the case of both crops comparatively few sellers were fortunate enough to have their own means of transport. Payment for transport, indeed, could hardly be more firmly institutionalised: even half-bags of cocoa are generally charged for pro rata and even relatives, it was found, clearly understand and accept that the costs of transportation need to be covered and shared each trip that is undertaken. The bulkiness of copra makes movement a problem even over short distances: in Gaulim (East New Britain) one villager commented that he had been obliged to pay K3.00 for a vehicle to carry a load of copra 400 metres to a nearby drier.

It was observed above that the passenger fare was a substantial component of transport cost due to the practice of accompanying produce to the point of sale, together with the lack of bulk-building. To verify this practice, villagers were asked if they had, indeed, accompanied the last consignment sold (Table 30). For the most part they had done so, especially in the case of copra. Some 20 per cent of respondents with cocoa had not.

Villagers were also asked to specify the mode of transport to the point of sale (Table 31). The primary mode was the public motor vehicle (PMV) or, in New Britain, the local pick-up, generally operated by one of the more affluent villagers also engaged in cultivation. The large proportion hand-carrying their cocoa in East and West Sepik reflects the existence of roadside buying, with buyers coming to the village, and in some cases the establishment of a DAL fermentary locally. In parts of West Sepik, however, villagers are willing to undertake several hours' walk to hand-carry wet beans to the nearest point of sale. In West Sepik (far west) the canoe becomes an important mode of transport for produce.

We could say that in Papua New Guinea growers generally rely upon the informal sector, particularly the PMV but also, as just observed, their own feet or their own canoe, to deliver their product for sale. This avoids the high administrative costs of many top-heavy bureaucratic systems which exist in other countries and has many advantages, particularly flexibility and the capacity to adjust to a variety of situations. There are obvious weaknesses, particularly the lack of bulk-building and the high transport costs observed. But on the whole it appears sensible to promote the informal sector, for instance by facilitating the hire purchase of more PMVs, within the limits justified by market demand, rather than trying to replace it.

One of the ways in which the informal sector reduces costs of transporting produce is by combining objectives. Where a villager is in any case planning a visit to the town, he may also carry produce and to this extent the passenger fare element is already

covered. The importance of this should not be exaggerated, as we have seen, and is much less relevant where distances are long and social or other visits less frequent. Nevertheless it does make some contribution, throughout Papua New Guinea. It has been commented (O'Sullivan and Partners 1985) that -

"In some parts of the country, the demand for transport is shifting from production to consumption activities. For example, in Oro outside the Popondetta Census Division, the rural transport system carried about 1,600 tonnes of export crops and 2,400 tonnes of fresh food, but carries 5,000 tonnes of imports and over one million passengers per year."

This also indicates the possibilities for using backhauls on vehicles bringing in goods for the transportation of export crop consignments if a more flexible approach can be adopted.

With respect to the present efficiency of the informal sector, although villagers complain of delays in securing transport, the actual time they have to wait for it appears quite short (Table 32), often just a few hours, not very significant in the context of village life. This could run to several days, however, throughout West Sepik.

Nevertheless problems in securing transport or buyers did appear to impose a major cost on cocoa growers, a large proportion in West Sepik reporting that they had had their crop spoiled (Table 33) or actually lost part of their crop (Table 34) last year or in previous years. This effect occurred also in East Sepik (Table 35) but apparently not in East New Britain (Gazelle), no doubt because of the more developed road network and good availability of vehicles in that more affluent area.

The position is quite different with respect to copra, the majority reporting no effect of delays on the product. Copra can, indeed, be kept for two months or more without damage, and if it develops mould it is always possible to re-dry before selling, even if this involves some cost.

This fact suggests that, notwithstanding the recommendation just made to rely where possible on the informal sector for the assembly and movement of produce, consideration should be given by the Copra Marketing Board, with the cooperation of DAL, to the organisation of regular, periodic runs through the major villages to supplement (not replace) existing possibilities. The justification for this is (a) given the possibility of easy storage, numerous runs would not be required: monthly or bi-monthly runs, with prior publicity, would suffice; (b) there appears to be considerable unmarketed volume of copra in the villages as a result of the discouraging effect of low prices and high transport costs: thus in West Sepik a substantial proportion of copra producers stated that they had failed to sell all the copra they wanted last year and in previous years due to lack of transport or buyers or processing (Table 36); (c) there are possibilities of reducing transport costs through bulk movement of produce and elimination of the passenger fare element; and (d) transporters in rural areas appear much less interested in transporting copra, especially unaccompanied copra, relying more on cocoa wet beans and passenger traffic for their revenue. The suggestion that organised collection of copra at the village level should be instituted met with a virtually unanimous and highly enthusiastic response from villagers (Table 37), with statements such as -

"many farmers will be interested in copra"...

"many growers would double their production"..., and

"it is an advantage for village farmers because they cannot spend a lot of money to pay for transport".

The collection of copra by the Copra Marketing Board or its agent would only be effective, of course, if costs could be kept lower than those being currently incurred by villagers so that higher farm-gate prices for copra could be paid than the present net grower prices. The comments expressed, however, do support the suggestion of unmarketed potential and positive potential supply response.

Table 25
Transport costs and net grower prices for cocoa wet bean,
various locations in East New Britain and East and West Sepik

Location	Port (price paid)	Unit	Gross payment (Kina)	Transport rate	Transport cost (Kina)	Transport cost as per cent of gross payment	Net grower price (t/kg)	R
East New Britain								
Vunadidir	Rabaul (46t)	75 kg	34.50	10% + K2 pass. return	5.45	16.0	38.7	
Malabunga		(3 bags)						
Gaulim		25 kg	11.50		3.15	27.4	33.4	
Taulil		(1 bag)						
Vunga								
Watom Island	Rabaul (46t)	75 kg	34.50	K2/bag + K4 pass.retn.	10.00	29.0	33	
		25 kg	11.50		6.00	52.2	22	
Duke of York Is.	Rabaul (46t)	75 kg	34.50	K2/bag + K8 pass.retn. + K1/bag	17.00	49.3	23	
		25 kg	11.50		11.00	95.7	2	
Wide Bay (excluding costs up to Wide Bay)	Rabaul (46t)	75 kg	34.50	K2.30/bag or K3/bag + K3	36.90	107.0	-3.2	
		25 kg	11.50		32.30	208.9	-27.7	
Pomio (excluding costs up to Pomio)	Rabaul (46t)	75 kg	34.50	K2.60/bag or K4/bag + K40 pass. retn.	47.80	138.6	-17.7	
		25 kg	11.50		42.60	370.4	-124.4	
Uvol/Nelkoi (excluding costs up to Uvol)	Rabaul (46t)	75 kg	34.50	K2.75/bag + K40 pass. retn.	48.25	140.0	-18.3	
		25 kg	11.50		42.75	371.7	-125.0	
Gasmata (excluding costs up to Gasmata)	Rabaul (46t)	75 kg	34.50	K2.95/bag + K50 pass retn.	58.85	170.6	-32.5	
		25 kg	11.50		52.95	460.4	-165.8	
Lassul/New Massava (excl. costs to Lassul)	Rabaul (46t)	75 kg	34.50	K2.20/bag + K24 pass. retn.	30.60	88.7	5.2	
		25 kg	11.50		26.60	231.3	-60.4	
Gasmata (excluding costs to Gasmata)	Rabaul (46t)	75 kg	34.50	K250/bag + K26 pass. retn.	33.50	97.1	1.3	
		25 kg	11.50		28.50	247.8	-68.0	

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Table 25 (continued)

Location	Port (price paid)	Unit	Gross payment (Kina)	Transport rate	Transport cost (Kina)	Transport cost as per cent of gross payment	Net grower price (t/kg)
East Sepik							
Karawop	Wewak	75 kg	31.50	K2/bag +	10.00	31.7	28.7
Boiken	(42t)	25 kg	10.50	K4 pass. retn.	6.00	57.1	18.0
Lowan, Balam	Wewak	75 kg	31.50	Roadside	Sepik Cocoa Growers' price		40.0
Kauk, Sowan	(42t)	25 kg	10.50	buying	January 1988		40.0
West Sepik							
Swain	Wewak	75 kg	31.50	K4/bag +	22.00	69.8	12.7
	(42t)	25 kg	10.50	K10 pass. retn.	14.00	133.3	-14.0
Paup	Aitape	75 kg	31.50	K1/bag +	5.00	15.9	35.3
	(42t)	25 kg	10.50	K2 pass. retn.	3.00	28.6	30.0
Siaute	Aitape	75 kg	31.50	K1/bag +	4.00	12.7	36.7
	(42t)	25 kg	10.50	K1 pass. retn.	2.00	19.0	34.0
Tumleo	Aitape	75 kg	31.50	K1/bag + K1.40	7.40	23.5	32.1
	(42t)	25 kg	10.50	pass. retn. + K1/bag from wharf	3.40	32.4	28.4
Mallol	Aitape	75 kg	31.50	K1/bag + K1.40	5.40	17.1	34.8
	(42t)	25 kg	10.50	pass. return	2.40	22.9	32.4
Poro	Aitape	75 kg	31.50	K2/bag + K1	7.00	22.2	32.7
	(42t)	25 kg	10.50	pass. return	3.00	28.6	30.0
Warapu, Sissano	Aitape	75 kg	31.50	K1/bag + K14	17.00	54.0	19.3
	(42t)	25 kg	10.50	pass. return (by boat) OR K4 pass retn. + K2.50 tractor + Mallol charges (by canoe)	15.00	142.9	-18.0
					13.90	44.1	23.5
					8.50	81.0	8.0
Waramo, Ossima	Vanimo	75 kg	31.50	DAL roadside	-	-	40.0
	(42t)	25 kg	10.50	buying	-	-	40.0

Table 26
Transport costs and net grower prices for copra, various locations
in East New Britain and East and West Sepik

Location	Port (price paid)	Unit (bags)*	Gross payment (Kina)	Transport rate	Transport cost (Kina)	Transport cost as per cent of gross payment	Net grower price (t/kg)	Net grower price as per cent of CMB depot price
East New Britain								
Vunaditir, Malabonga, Gaulim	Rabaul (K15/bag)	6 2	90 30	K2/bag + K2 K2 pass. retn.	14.00 6.00	15.6 20.0	12.67 12.00	84 80
Taull, Vunga	Rabaul (K15/bag)	6 2	90 30	K3/bag + K2 pass. retn.	20.00 8.00	22.2 26.7	11.67 11.00	78 73
Watom Island	Rabaul (K15/bag)	6 2	90 30	K2/bag + K4 pass. retn. + K1/bag to CPL	22.00 10.00	24.4 33.3	13.00 10.00	87 67
Duke of York Is.	Rabaul (K15/bag)	6 2	90 30	K2/bag + K8 pass. retn. + K1/bag to CPL	26.00 14.00	28.9 46.7	10.67 8.00	71 53
Wide Bay	Rabaul (K15/bag)	6 2	90 30	K2.30/bag + K30 pass. retn.	43.80 34.60	48.7 115.3	7.70 -2.30	51 -8
Pomio	Rabaul (K15/bag)	6 2	90 30	K2.50/bag + K40 pass. retn.	55.00 45.00	61.0 150.0	5.83 -7.50	39 -50
Uvol/Nelkai	Rabaul (K15/bag)	6 2	90 30	K2.75/bag + K40 pass. retn.	56.50 45.50	62.8 151.7	5.58 -7.75	37 -52
Gasmata	Rabaul (K15/bag)	6 2	90 30	K2.95/bag + K50 pass. retn.	67.70 55.90	75.2 186.3	3.72 -12.95	25 -86
Tasaul/New Massava	Rabaul (K15/bag)	6 2	90 30	K2.20/bag + K24 pass. retn.	37.20 28.40	41.3 94.7	8.80 0.80	59 5
Stockholm	Rabaul (K15/bag)	6 2	90 30	K2.50/bag + K26 pass. retn.	41.00 31.00	45.6 103.3	8.17 -0.50	54 -3

Note: * 14 bags to the tonne.

Table 26 (continued)

Location	Port (price paid)	Unit (bags)*	Gross payment (Kina)	Transport rate	Transport cost (Kina)	Transport cost as per cent of gross payment	Net grower price (t/kg)	Net grower price as per cent Rabaul dealers' price
East Sepik								
Karawop,	Wewak	6	90	K2/bag + K4	16.00	17.8	12.33	82
Boiken,	(K15/bag)	2	30	pass. retn.	8.00	26.7	11.00	73
Lowen								
Balam, Kauk,	Wewak	6	90	K3/bag + K6	24.00	26.7	11.00	73
Sowam	(K15/bag)	2	30	pass. retn.	12.00	40.0	9.00	60
West Sepik								
Swain	Wewak	6	90	K4/bag + K10	34.00	37.8	9.33	62
	(K15/bag)	2	30	pass. retn.	18.00	60.0	6.00	40
Paup	Aitape	6	70.74	K1/bag + K2	8.00	11.3	10.46	70
	(K11.79/bag)	2	23.58	pass. retn.	4.00	17.0	9.79	65
Siaute,	Aitape	6	70.74	K1/bag + K1	7.00	9.9	10.62	71
Mallol	(K11.79/bag)	2	23.58	pass. retn. (Mallol K1.40)	3.00	12.7	10.29	69
Tumleo	Aitape	6	70.58	Boat K2/bag	19.20	23.3	8.56	57
	(K11.79/bag)	2	23.58	+ K1.20 pass. retn. K1/bag PMV	7.20	30.5	8.19	55
Romei	Aitape	6	70.58	K1.5/bag +	11.00	15.6	9.93	66
	(K11.79/bag)	2	23.58	K2 pass. retn.	5.00	21.1	9.29	62
Warapu,	Aitape	6	70.58	K1/bag + K14	20.00	28.3	8.43	56
Sissano	(K11.79/bag)	2	23.58	pass. retn. (by boat)	16.00	67.9	3.79	25
				OR				
		6	70.58	K4 pass. retn.	11.90	16.9	9.78	65
		2	23.58	K2.25 + tractor Mallol charges	9.90	42.0	6.84	46
Waramo, Ossima	No copra							

Notes * 14 bags to the tonne.

Table 27
Representative sizes of growers' actual consignments of copra and cocoa
from different locations, with associated net grower prices

Location	Copra							Cocoa				
	General range observed bags	Representative consignment size bags	net grower		Representative small lot size bags	net grower		General range observed kg	Representative consignment size kg	net grower		Representative small size kg
			K/bag	%		K/bag	%			t/kg	%	
Vunadidir	6-12	8	12.75	85	-	-	-	10-180	60	38	83	20
Malabunga	2-8	6	12.67	84	2	12.00	80	10-150	75	39	84	15
Gaulim	2-8	5	12.60	84	2	12.00	80	40-130	75	39	84	40
Taulil	2-20	6	11.67	78	3	11.30	76	10-650	150	40	87	40
Karawop	2-14	6	12.33	82	2	11.00	73	25-200	75	29	62	25
Boiken	2-9	6	12.33	83	2	11.00	73	10-150	50	30	65	25
Lowan	2-9	7	12.43	83	2	11.00	73	12-120	46	40	87	25
Balam	3-11	9	11.33	76	3	10.00	67	18-100	50	40	87	25
Kauk	3-18	8	11.25	75	3	10.00	67	15-120	40	40	87	25
Sowan	1-16	7	11.10	74	2	9.00	60	12-160	100	40	87	25
Swain	6-12	9	9.90	66	6	9.33	62	4-50	26	-14	-30	25
Paup	2-8	4	10.29	69	2	9.79	65	20-40	25	30	65	25
Siaute	1-11	4	10.54	70	2	10.29	69	10-80	40	37	80	15
Tumleo	2-11	5	8.55	57	2	8.19	55	-	-	-	-	-
Mallol	1-4	2	10.29	69	1-1/2	9.86	66	15-110	35	35	76	25
Poro	-	-	-	-	-	-	-	5-200	60	34	73	25
Romei	-	-	-	-	-	-	-	7-50	30	-	-	10
Warapu	-	-	-	-	-	-	-	18-80	50	22	48	25
Sissano	-	-	-	-	-	-	-	3-50	15	-14	-30	15
Waramo	-	-	-	-	-	-	-	15-250	25	-	-	15
Ossima	-	-	-	-	-	-	-	15-130	25	-	-	15

Table 28
Was the transporter paid by the grower or the buyer?

	East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik far west	Total
Cocoa¹						
Grower	n.a.	28	35 (6)	7 (5)	11	81 ¹ (11)
Buyer	n.a.	32	36 (6)	9 (5)	3	80 ¹ (11)
Copra						
Grower	n.a.	53	64	1	0	118
Buyer	n.a.	0	1	0	0	1

Note: 1. Includes 11 respondents (in brackets) who generally sold to a roadside buyer who was responsible for transportation but at other times had to organise their own transport and pay for it. These respondents appear under both heads here.

Table 29
Did the grower pay for transport?

	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	%
Cocoa							
Yes	54	31	35	6	20	146	48.3
Yes, if not collected by DAL at roadside	0	0	5	5	0	10	3.3
Sub-total	54	31	40	11	20	156	51.7
No roadside buying	1	22	34	20	10	87	28.8
No, handcarried to point of sale	6	4	4	7	1	22	7.3
No, own transport	3	0	2	0	2	7	2.3
No, cost paid by buyer	0	7	1	0	0	8	2.6
No, carried by friend, relative	2	0	0	0	1	3	1.0
No, reason not specified	1	12	2	1	3	19	6.3
Sub-total	13	45	43	28	17	146	48.3
Total, cocoa	67	76	83	39	37	302	100.0
Copra							
Yes	47	61	70	3	2	183	96.8
No, own transport	2	0	4	0	0	6	3.2
Total	49	61	74	3	2	189	100.0
Not answered¹							
Cocoa	8	3	15	6	16	48	-
Copra	17	1	15	8	40	81	-

Note: 1. Generally those not growing the crop in question.

Table 30
Did you accompany the (last) consignment of cocoa/copra
to the point of sale?

		East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	%
Yes ¹	cocoa	59	59	69	20	21	228	76.3
	copra	42	61	69	3	1	176	85.0
Taken by wife, son or daughter	cocoa	2	2	4	0	0	8	2.7
	copra	3	2	4	0	0	9	4.3
Taken by relative or friend	cocoa	1	0	0	0	0	1	0.3
	copra	1	0	2	0	0	3	1.4
Taken by driver, boat owner	cocoa	1	0	0	0	1	2	0.7
	copra	0	0	0	0	0	0	0.0
No ²	cocoa	10	18	8	9	15	60	20.1
	copra	5	0	2	5	7	19	9.2
Not answered ³	cocoa	4	8	18	10	23	63	-
	copra	16	24	22	31	51	144	-
Total excl. not answered	cocoa	73	79	81	29	37	299	100.0
	copra	51	63	77	8	8	207	100.0
Total	cocoa	77	87	99	39	60	362	-
	copra	67	87	99	39	59	351	-

- Notes:**
1. May involve only hand-carrying to roadside for purchase by roadside buyer.
 2. Implies consignment taken by someone else.
 3. Includes people not growing the crop in question.

Table 31
How was the cocoa/copra transported to the point of sale?

		East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.
Handcarry ¹	cocoa	11	50	49	35	14	159
	copra	0	2	5	0	1	8
Local pick-up	cocoa	47	9	3	1	2	62
	copra	38	8	4	1	1	52
Friend or relative's vehicle	cocoa	5	1	0	0	0	6
	copra	3	1	0	0	0	4
Group vehicle	cocoa	1	5	1	0	0	7
	copra	1	6	10	0	0	17
Own vehicle	cocoa	7	1	1	0	0	9
	copra	5	0	3	0	0	8
Own canoe or boat	cocoa	0	1	1	1	35	38
	copra	0	0	1	0	2	3
PMV	cocoa	6	17	45	3	6	77
	copra	0	48	54	4	2	108
Bus	cocoa	0	0	0	0	0	0
	copra	0	0	2	0	0	2
Buying comp. any vehicle	cocoa	0	2	0	0	0	2
	copra	0	0	0	0	0	0
Not answered ²	cocoa	4	7	15	2	18	46
	copra	17	23	19	34	53	146
Total	cocoa	81	93	115	42	75	406
	copra	64	88	98	39	59	348

Notes:

1. Includes wheelbarrow, bicycle in very few cases.
2. Includes people not growing the crop in question.

Table 32
Delay incurred in finding transport for last consignment

		East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	%
A few hours, less than one day	cocoa	23	14	17	2	3	59	37
	copra	14	8	6	1	-	29	29
1 day	cocoa	3	4	49	5	5	66	41
	copra	3	28	20	-	-	51	51
Several days	cocoa	-	3	10	8	10	31	19
	copra	-	9	9	1	-	19	19
1 week	cocoa	-	-	-	-	4	4	2
	copra	-	1	-	-	-	1	1
More than 1 week	cocoa	-	-	-	-	1	1	1
	copra	-	-	-	-	-	-	-
Total responding	cocoa	26	21	76	15	23	161	100
	copra	17	46	35	2	-	100	100

Table 33
**Was any of your wet bean crop spoiled last year due to lack of
transport or buyers? And in previous years?**

	West Sepik coastal	West Sepik inland	West Sepik far west	Total
Last year				
Yes	51	25	25	101
No	29	11	15	55
Not answered	21	3	20	44
Previous years				
Yes	30	4	14	48
No	25	4	14	43
Not answered	46	9	26	81

Table 34
Did you lose any of your wet bean crop last year due to lack of transport or buyers?

	West Sepik coastal	West Sepik inland	West Sepik far west	Total
Last year				
Yes	38	20	27	85
No	48	17	17	82
Not answered	19	2	16	37
Previous years				
Yes	24	12	19	55
No	53	24	15	92
Not answered	22	3	26	51

Table 35
What effect, if any, do delays in purchasing have on your crop?

	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.
Cocoa						
Loss of weight (and therefore income)	3	39	22	17	0	81
Spoiled	0	3	9	13	9	34
Leads to transport costs	0	3	0	0	0	3
Other effects	0	3	0	0	0	3
No effect	18	12	13	1	5	49
Not answered	17	7	3	1	9	37
Total	38	67	47	32	23	207
Copra						
Goes bad, develop mould	1	5	7	0	0	13
Insect damage	0	2	0	0	0	2
Gets dry	0	0	1	1	0	2
Involves costs of re-drying	0	1	0	0	0	1
Leads to transport cost	0	1	1	0	0	2
Other effects (delay in buying consumer goods)	0	1	0	0	0	1
No effect	12	24	16	1	0	53
Not answered	19	10	5	1	1	36
Total	32	44	30	3	1	110

Table 36
Did you fail to sell all the copra you wanted last year
due to lack of transport or buyers or processing?
And in previous years?

	West Sepik coastal	West Sepik inland	West Sepik far west	Total
Last year				
Yes	28	6	7	41
No	45	3	8	56
Not answered ¹	25	30	45	100
Previous years				
Yes	25	6	5	36
No	46	3	6	55
Not answered ¹	24	30	48	102

Note: 1. Mostly reflects non-production of copra.

Table 37
Would it be a good idea if the traders or the
Copra Board passed by the village to collect copra?

	West Sepik coastal	West Sepik inland	West Sepik far west	Total
Yes	85	18	9	112
No	2	0	2	4
Not answered ¹	10	20	46	76

Note: 1. Mostly reflects non-production of copra.

Chapter 7

COCOA PROCESSING AND THE REGULATION OF THE COCOA INDUSTRY

The general policy adopted in Papua New Guinea towards the marketing of cocoa and copra is one of promoting a free enterprise system, with a limited degree of direct intervention. In the case of cocoa, price stabilisation relies on bounties or levies injected into the system by the Cocoa Industry Board via the main exporters without direct parastatal handling of the product. A further step towards a freer system was taken in 1987, when responsibility for initial grading for export was transferred to the exporters themselves with samples only checked by government produce inspectors. In the case of copra, the Copra Marketing Board has felt obliged to carry responsibility for the export of the product after collection at a restricted number of depots and sub-depots without particular concern for the manner in which copra reaches these depots.

The Cocoa Industry Board, however, does exist as a relatively strong body concerned especially with standards and the maintenance of quality, to which end it imposes a number of regulations which affect the industry in an important way. The Board itself was established under the Cocoa Industry Act of 1974, under which also all fermentaries now had to be registered, the process of registration being carried out during 1976. The Board was given comprehensive statutory powers over the industry, from grower to export, under the subsequent Cocoa Act of 1981.

The regulations introduced which are of most relevance to the efficiency of marketing are perhaps the following -

1. Dealing in dry bean is not allowed. Once processed, the dry bean must be transported and sold directly to a licensed exporter.
2. To establish a fermentary to process one's own cocoa wet bean, however, there has been a requirement since the end of 1975 of a minimum of 5,000 cocoa trees owned, equivalent to about 2-1/2 to 3 hectares or two tonnes of dry bean per annum. This requirement is being applied currently in East Sepik, for example, as standard.
3. Dealing in wet bean without a cocoa dealer's licence is illegal and liable to a fine of K1,000 or six months' imprisonment under the 1981 Cocoa Act, as emphasised again in a circular issued by the Board in June 1987.
4. To buy wet bean from others a fermentary requires also a dealer's licence, for which an output of 25 tonnes per annum of dry bean is needed (Perkins and Clarke 1980, p.10).
5. Following the report of the Cocoa Industry Investigating Committee of 1987, which recommended the issue of no further dealer licences (p.8) a Cocoa Board circular of November imposed a temporary ban on their issue. While this ban may not be more than temporary, the current practice of the Board, as recently reiterated, is to be strict with the issue of new dealer licences, requiring very detailed justification of the need by growers for additional service.

Despite this background of regulation, policy as practised has evolved to a considerable extent and has not been uniform. Indeed, the selection of East New Britain and East and West Sepik as representative areas for study is particularly useful, offering two contrasting applications of policy affecting the development of the industry. In East New Britain the issue of licences has been relatively liberal, resulting in a large number of small, independently-owned fermentaries and fermentary-dealers exhibiting, as we shall see presently, a high mortality or turnover rate. In East Sepik the number of applications for new fermentaries is increasing and applications now appear to be receiving more favourable attention. But policy in the past has been quite restrictive and the emphasis has been on centralised processing facilities, particularly those controlled by the umbrella cooperative organisation, the Sepik Cocoa Growers Association (SCGA). The contrast in the number of fermentaries in existence in the two regions has already been commented upon (Table 5). The purported rationale for the restrictive policy is that of controlling standards and maintaining quality : raising the issue of whether this is not equally applicable in both regions. If the policies pursued in the two regions do stand in contrast with one another, the question arises as to which is the correct one : what is an appropriate development policy for the cocoa industry?

A critical policy choice beyond the production level is in processing, specifically the size of fermentary and of processing enterprise to be encouraged and promoted or even, because the Cocoa Board has, through licensing, full powers of control, to permit. This leads on to questions of the structure of the industry and the way in which the wet bean and dry bean are handled and marketed. The case for larger-scale units and restriction in the number of fermentaries licensed has generally been based on two arguments, that of economies of scale in processing, affecting unit costs of production, and that of quality, involving different reasons why quality control may be less effective in small fermentaries. A third argument, related to security, is commented upon on p. 52.

A not altogether satisfactory study of unit costs by size of factory, carried out in 1986 by Morley, nevertheless offers certain pointers. Clearly more expensive are the cooperative enterprise and the "large managerial firm" (Table 38), the latter particularly because of high wage costs, high managerial (salary) expenses and electricity costs (Table 39). The cooperative enterprise was expensive compared with a small village fermentary, for example, because of high wage costs (compared with family labour but also due to the numbers employed, if we compare with hired labour costs for the medium-sized unit) and of payment for a manager. In addition interest on capital is a significant item. Morley emphasises underutilisation of plant and of employees, though the latter (including the manager) seems much the more important.

While the large entrepreneurial unit appears the best option, on the figures provided, the low transport costs assumed are questionable, as are the absence of management costs, lack of significant interest costs, and low fuel costs.

If we compare instead the small village fermentary and the medium-sized enterprise, while the latter is shown as having unit costs lower by K53 per tonne, it is difficult to see why no drier fuel costs are included for this category. The pricing of family labour costs for the village fermentary at K36 a fortnight requires certain assumptions. The high costs of using PMV transport may be appropriately reflected, as our own study indicates, but vehicle depreciation may have been seriously underestimated for the medium-sized enterprise. As will be seen presently, the cost of transport is vital but involves more complicated calculations of how far wet bean or dry bean have to be transported, and the result will differ according to the spacing of

fermentaries and the distances involved, differing, for example, between East New Britain and East Sepik, and even between the Gazelle and non-Gazelle portions of East New Britain.

The strongest conclusions that one would like to draw from the data, therefore, apart from the drawbacks of the cooperative and of the very large-scale enterprise is that a relatively small fermentary, not necessarily the smallest village fermentary, is likely to be competitive in unit costs of production terms : we need to consider each situation, however, in terms of the transport cost difference. The Morley study, it should be noted, does not consider the quality aspect which has been such a consideration in deciding policy.

In comparing the economics of small and large fermentaries two elements need to be taken into account, apart from possible differences in product quality, difference in unit production costs associated with scale, and differences in transport cost associated with differences in location and the relative costs of transporting dry bean and bulkier, more perishable wet bean. The requirement that applicants for a fermentary licence must have a minimum holding of 5,000 cocoa trees is highly restrictive : in the established cocoa growing areas of Papua New Guinea the most common holdings would be only one-tenth of this, some 500-600 trees, and in areas where cocoa is being developed it would be much less. The effect of the restriction, reducing the number of small fermentaries located within the producing areas may be either to force growers to sell wet bean over longer distances, in small lots, increasing transport costs; or to encourage roadside buying by larger companies, which still means long distance carriage of wet bean and may increase the degree of monopoly or, by increasing the size of organisation required, create problems of management, such as experienced in East Sepik by SCGA and Lus Development Corporation; or to artificially encourage the formation of cooperative or group fermentaries.

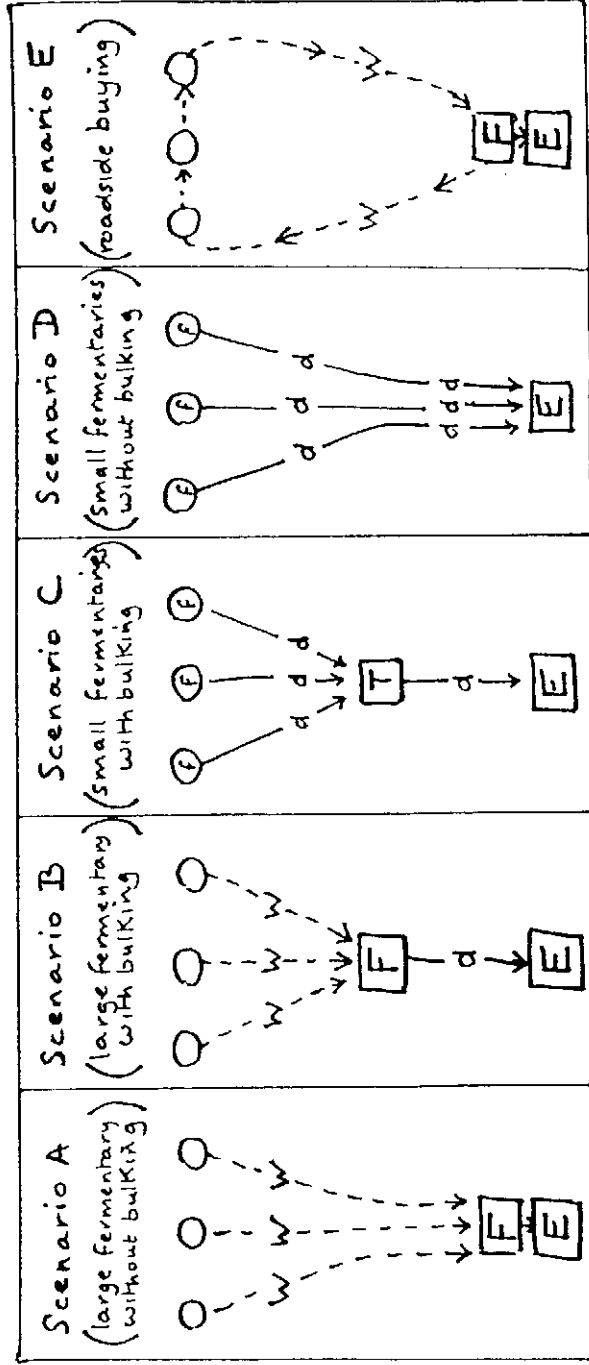
The policies pursued in East New Britain, with comparatively liberal licensing of small fermentaries, and in East Sepik, where policies have been till recently quite restrictive, stand in interesting contrast. As we have seen, in East Sepik there is haulage of small consignments of wet bean over long distances, affecting net grower prices, and at the same time substantial development of roadside buying, in which the SCGA is dominant. It is not surprising that the provincial government supported the SCGA over a long period, given its pioneering role in developing cocoa production in the province and the subsequent positions of political influence enjoyed by its leading executives, and that it pursued the restrictive policy which it did. Since 1985 there has been a change in policy and a dramatic increase in the number of fermentaries (Table 40). This appears to be provoking an even greater level of new applications although since the 5,000-tree minimum is still being applied, these applications are frequently shared among several people. Thus out of a 1987 sample of 17 applications examined, at least 11 were from family groups, in which leading individuals in a number of cases, incidentally, had gained experience as SCGA or Lus Development Corporation directors.

It can be assumed that if the current policy is maintained the morphology of cocoa marketing in East Sepik will progressively approach that of East New Britain. SCGA will find the amount of wet bean available for roadside purchase diminishing over time, along with its share of the market.

The impact of fermentary size and location on transport cost can be illustrated as in Figure 1. The alternative scenarios all represent the same situation whereby wet bean needs to be collected from a number of dispersed producing areas, represented here schematically by three points, processed and delivered to the export point E.

Figure 1

Alternative transport cost scenarios for large and small fermentaries



In Scenario A the large fermentary-dealer is located near to the export point, as in the Gazelle Peninsula, and wet bean is transported, without bulking, from each producing area all the way to this point. Heavy transport costs are incurred as a result of transporting bulky wet bean and due to the absence of bulk-building. This may be economic over short distances, as in the Gazelle, especially if growers are already travelling as passengers to Rabaul for other reasons. Over longer distances it is extremely unlikely to be economic and the costs of travel are unlikely to allow growers to make frequent trips to the export point for social or other reasons.

In this situation the choice is more likely to be between Scenarios B to D. In B the choice is of a large fermentary within easier reach of the dispersed growing areas. Wet bean is transported as before but over reduced distances. From the fermentary only dry bean need be transported and it can first be bulked by the fermentary for transportation. Scenario C affords the closest comparison with this, where the choice instead is for small village fermentaries at dispersed sites within the producing areas. It is assumed here that dry bean is bulked after re-sale to a trader at the same central point as before. The position between points T and E is identical to Scenario B. The advantage over Scenario B is that the transport of bulky wet bean is completely eliminated (apart from hand carriage to the village fermentary) and some advantages of bulk-building of dry bean between village and trading centre are also secured. As noted above, this scenario is prohibited in Papua New Guinea as trading in dry bean is illegal.

Instead village fermentaries are required to transport their dry bean themselves to the exporter as in Scenario D. This retains the advantage of transporting only dry bean, but loses some benefits of bulk-building associated with the previous option.

Scenario E depicts more accurately current practice in East and West Sepik. Processing is, or has been till recently, centralised near to the export point. To achieve economies of transportation, however, given the longer distances involved and growers' reduced access to private transport, the large processor engages in roadside buying, sending his own truck to collect wet bean from the villages. Advantages of bulk-building are obtained, but not those of transporting dry bean.

Returning to the basic comparison between Scenarios B and D, we need to consider how far the advantages of the latter would be passed back to the grower in practice, and how important these might be quantitatively. On the face of it substantial savings might be secured at locations such as Karawop and Swain in East and West Sepik where transport cost was calculated respectively as 32 and 70 per cent of the gross payment to growers. Since 1,000 kilograms of dry bean is equivalent to 2,500 kilograms of wet bean it is in principle possible to carry the equivalent of 7-1/2 bags of wet bean in dry form in place of the representative amount of 3 bags employed earlier (Table 25), the percentages would fall on a simple calculation based on weight to 13 and 28 per cent respectively¹. This implies a substantial potential increase in the net grower price to set against any unit production cost reductions associated with medium or large-scale processing.

1. Not allowing for the increase in value added by processing, which would reduce the percentages still further. It is possible, of course, that PMV operators, basing their charges on the value of the goods transported rather than on the space they occupy, would raise these, reducing the advantage to the grower. Competition between operators would reduce this effect. And village fermentaries would more likely transport their own product anyway.

Even this calculation assumes that the passenger element in transport cost, which is substantial, is retained. In practice village fermentaries would either operate their own transport or hire available local transport for bulk shipment, eliminating the passenger charge. If savings were made in this way equivalent to, say, half the passenger charge, the transport cost percentages would fall further to 10 and just over 20 respectively, from the original 32 and 70.

Certain additional benefits from a system of decentralised processing may obtain, however.

1. While wet bean may be stored for three days without spoiling, dry bean may be stored for two months. This is likely to mean : (a) reduced wastage of product and lower rate of rejection of delivered product; (b) increased possibilities of bulking at the village level with, among other things, elimination or substantial reduction of the passenger element; and (c) securing of an improved grower price due to the possibility of more opportunistic selling.
2. Secondly, small-scale processing would be likely to increase significantly the proportion of value-added retained in the village, contributing to greater equality and spread of incomes. As indicated to the author by senior executives in the cocoa trade, profits lie not in trading, the purchase of wet or dry bean itself, but in processing. This is therefore quantitatively a strong reason for favouring village processing. Due to these profits, a restrictive policy may also be in danger of allowing favouritism or influence in the issue of licences.
3. Restriction in the number of fermentaries is associated also with restriction in the number of dealers, and therefore with an increase in the degree of local monopoly. It has been observed that "owning a dealer's licence provides access to a captive market" (Perkins and Clarke 1980, p.13), with pressure for villagers to support the local "big man". Competition for wet bean from neighbouring village fermentaries would reduce this.
4. Perkins and Clarke have argued also that the minimum size requirement imposed by the Cocoa Board for a fermentary-dealer licence leads to the artificial encouragement of cooperative or group fermentaries and the formation of unstable business groups. "Despite being unpopular" they state (p.15), "these groups still remain : they are the only legal avenue open for growers to move into wet bean buying". They argue also that business accounting within the group is made difficult by the fact that members do not sell their wet bean as such to the group fermentary, all transactions having to be transactions on paper only.
5. It has been suggested that owning his own fermentary provides an important incentive to the producer to develop his cocoa block. Pride in his enterprise will ensure his willingness to repay any capital loan involved.
6. A large central fermentary may create security problems as a result of moving with substantial amounts in cash. This may be true where roadside buying over extended communication lines is involved or where a large company operates a number of buying points. A major buyer in East New Britain affirmed its reluctance to open additional buying points on these grounds. This implies a reduced degree of bulk-building of wet bean and corresponding increases in transport costs for wet bean. It has been suggested that the smaller size of cash transactions associated with a larger number of small fermentaries based within the community which each enterprise serves offers a better guarantee of security.

The problem of theft of the bean itself is regularly used as an argument in favour of more centralised operations and against freer trading in dry bean. This is not a strong argument : stealing of a neighbour's wet bean is not affected by whether it is taken to a small local fermentary or a more distant larger one. The 1982 study of coffee marketing (CIB 1982) rejected the theft argument as a case for tighter control of that system.

7. On the management side there has been a problem affecting large and small fermentaries of finding responsible clerks for the purchase of wet bean. A large firm or cooperative association operating a number of buying points or engaged in roadside buying using agents is, however, likely to have the greater problem of supervision and control.

As noted previously, however, official discussions focus little on unit costs of production and hardly at all on differential transport cost : the emphasis here is almost entirely on quality and whether small fermentaries can be safely relied upon, given the need to preserve the reputation of Papua New Guinea cocoa in international markets. Here a number of observations may be made :

1. There does not appear to have been any decline in quality, if anything the reverse, as the number of small fermentaries has increased in East New Britain and North Solomons provinces particularly. The proportion of non-export, nibs and residue to the total, all grades, fell from 6.3 per cent in 1978/79 to 2.8 per cent in 1986/87 (Table 41). While quality may not be perfectly measured by this percentage, it does serve as an index which at least does not indicate decline. Moreover in 1987, for example, the proportion of non-export and residue from smallholders was negligible (0.3 per cent) and much more significant in relation to plantations (5.6 per cent) (Table 42), although this may be simply that only plantations bother to keep and market nibs and residue, while reject village cocoa may be taken back to the village for reprocessing or discard.
2. There is periodic expression of grave concern over an alleged serious decline in quality, of crisis proportions, which eventually is not supported by the evidence. Thus the introduction to the 1987 Cocoa Industry Investigating Committee Report states that -

"In a larger scale, Papua New Guinea cocoa, one of the best in the world, for the last couple of years has been experiencing an increasing drop in its quality....The drop in quality of our cocoa had been of great concern to our exporters... Because of this concern, the Cocoa Board set up (the Cocoa Investigating Committee) in March 1987 to find out why the quality was deteriorating and to recommend ways and means to improve the quality (Report, p.vi)."

But Perkins and Clarke (1980 p.3) described the situation during 1979 and the first half of 1980 in almost identical terms -

"In the past eighteen months there has been considerable concern expressed by the Government and the Cocoa Industry Board...about the quantity and quality of cocoa produced in Papua New Guinea. A very bleak picture has been painted of drastic drops in output and a slide in cocoa quality standards."

The same authors found that in fact -

"Papua New Guinea cocoa continues to sell at a small discount on the world market as it did in the past. Exporters state that Papua New Guinea cocoa is accepted by the manufacturers and few serious complaints are received by them."

This position appears still to exist in early 1988.

3. The eventual findings and observations of the Cocoa Industry Investigating Committee were favourable. Particularly relevant is that the Committee sought the users' opinion, that of the overseas manufacturers and found (p.3) that "cocoa quality as seen by manufacturers is consistent with former production", reference being made to its "good bean size, good fermentation, mostly clean cocoa and normally well-dried cocoa, particularly after shipping".

Price differentials for Papua New Guinea cocoa had worsened in fact, but not due to a change in Papua New Guinea quality : the reasons were some new marketing restrictions, competition from Malaysia with cocoa of similar or worse quality, and an overall world surplus.

Smoke problems, which had given concern earlier, had been virtually eliminated, as a result of industry awareness and the Board's decision on water-wide burners, unrelated to the issue of small fermentaries.

Particularly relevant and consistent with the statistics referred to above is the statement (p.6) made that -

"It is important to note that smallholder producers are in the main producers of good quality cocoa. The committee has found that many large producers (dealers and plantations) produce cocoa that could be improved in quality."

4. Examination of produce inspectors' reports show that the quality problem generally occurs at a specific fermentary at a specific time or over a specific period for particular reasons, usually a management problem. If we look at the incidence of non-export deliveries from East Sepik, for example (Table 40), it is easy to identify specific problems occurring at SCGA in 1986 and at But-Boiken in 1985, as well as more persistent problems at St. Anna, Yangoru and Angoram, even if overall the percentage has been very low. Rather greater teething difficulties have been encountered at DAL fermentaries. The problem at SCGA was one of limited capacity for coping with the flush at a time when there were few alternative buyers of cocoa, leading to bags being left in the open for as long as one week. The rise of alternative fermentaries has eliminated this possibility along the west coast.

Rather than attempt the physically impossible task, as at present, of visiting all fermentaries annually (there are just three inspectors for the whole of Papua New Guinea), data from produce inspectors' reports, specifically the amount or percentage of non-export deliveries,¹ can serve as a warning light calling for the Board, together with local DAL officers, to undertake immediate remedial action. The active involvement of DAL officers who know the local situation

1. Already, if a fermentary produces any quantity of non-export cocoa for three successive months, its licence may be cancelled.

closely is clearly essential. Exporters, likewise, have a critical role to play. The fact that exporters lose if their cocoa is rejected, since they will already have paid bounty on the consignment, provides a useful sanction ensuring that exporters will be vigilant. They in turn are in a position to pass their own sanctions, for instance access to credit, down the line.

5. As indicated earlier, the minimum-size cocoa block requirement imposed in the registration of individual fermentaries has the effect of encouraging groups to be formed, it has been said, artificially. Perkins and Clarke (1980 p. 13) assert that "Good quality cocoa is a function of management. Many groups that have formed to comply with the regulation requirements have already demonstrated their poor management."
6. It may be argued that much more serious in its effect on quality than the marketing/processing system is the incidence of disease. A 1979/80 Rural Survey carried out by the DAL showed that 42 per cent of trees in East New Britain suffered from black pod, 32 per cent from VSDB (Vascular Streak Die-back), as well as other diseases (Rural Statistics Bulletin, 1983/87, DAL).
7. It has been argued that an improvement in quality would be at the expense of quantity, and that the emphasis should be shifted back to quantity. This is certainly in line with the disappointing record of cocoa development outside the two main producing areas observed earlier. Perkins and Clarke (1980 p.5) point out that most Papua New Guinea cocoa is sold at a discount to Ghanaian cocoa on world markets, but that this discount is equal to only about 2 per cent of the terminal market price: any improvement in quality would at most only produce an increase in cocoa income of 2 per cent. From our own previous discussion, a further reason for an emphasis on quantity would be to broaden participation in cocoa production, partly for equity reasons and partly to achieve a "critical minimum effort" in developing cocoa in new regions.
8. A technical argument put forward by the Cocoa Board for insisting on a minimum dealer size and prohibiting dealing in wet bean is that a minimum number of boxes is needed for good fermentation. A circular of June 1987, requires dealers to have a minimum of four fermentation boxes in fact. This requirement for fermentary-dealers is unlikely to be effective if at the same time a much larger number of owner-fermentaries are operating below capacity and unable to purchase wet beans from their neighbours, in the absence of a licence. Quality may be maximised rather by encouraging competition in the purchase of wet beans such that an optimum size of fermentary emerges operating at its most efficient capacity level.

What implications emerge, then, from our discussion of scale economies in processing, transport cost differences and the issue of quality?

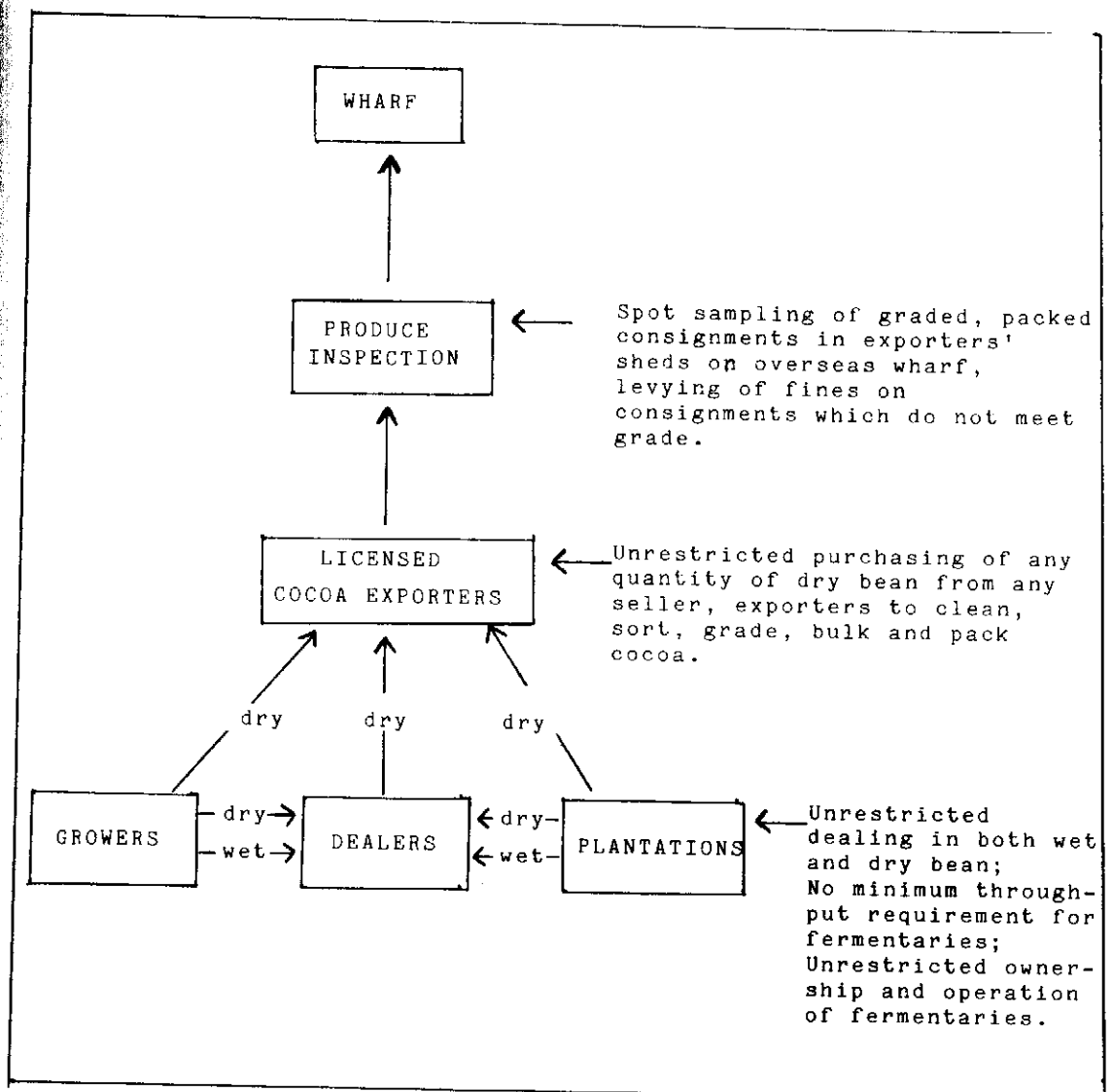
- The requirement of a 5,000-tree minimum holding for the issue of a fermentary licence should be abolished. The issue of a fermentary licence should be divorced from the question of number of trees owned and made on purely business considerations as for any other business enterprise.
- However, assistance in establishing small fermentaries should be stepped up through the extension service, using, where appropriate, standard designs such as the model pre-fabricated fermentary (cost K2,600) developed under the SCREPP programme in East New Britain.

- . A statistical monitoring system and firefighting approach to produce inspection should be applied to established and recently-established fermentaries, to replace routine visiting.
- . Free dealing in wet bean should be permitted, where this is at present confined to licensed dealers, to increase competition and to allow small fermentaries to improve their capacity utilisation as well as to encourage rural transporters to become more directly involved as primary traders buying the wet bean for resale and reducing the passenger element in cocoa marketing.
- . "Free dealing in wet bean" effectively means abolishing the differential between the fermentary licence fee of K30 per annum and that for a fermentary/dealer of K90 (the supplementary dealer's licence fee costs K60), but, more importantly, freer issue of licences. It may be sensible, however, for revenue purposes to maintain the dealer licence fee, or even increase it, for fermentaries with substantial turnovers only.
- . Dealing in bagged dry bean should be legalised. This would be unlikely to lead in Papua New Guinea to a significantly longer marketing chain with an excessive number of intermediaries. More likely each trader would serve a limited number of small fermentaries on the basis of a highly competitive profits margin, with fermentaries retaining their present option of delivering their own cocoa to the exporter using PMV or other informal modes of transport.
- . Sun-drying of cocoa should be encouraged, with the assistance of extension officers. Commenting on the parallel restriction which exists in the Solomon Islands under which small growers are not allowed to ferment cocoa themselves, but have to sell their wet bean to central fermentaries (not particularly central in Papua New Guinea) an acknowledged authority, Johann Scheu, President of the Cocoa Merchants' Association of America, noted (Scheu 1987a) that "whether this system is the best available remains under dispute, as some experts believe that heap fermentation and sun-drying - similar to the practice in Ghana - may well be better suited to the Solomon Islands than the transportation of wet beans to the fermentaries". The existence of a network of smaller fermentaries could facilitate this development, as they would be in a position also to purchase sun-dried bean.

It may be useful to summarise by means of diagrams. Figure 2 shows the system of cocoa marketing proposed in 1980 by Perkins and Clarke, based on the assumption of unrestricted dealing in wet or dry bean. This incorporates a recommendation which has already been adopted whereby, instead of dry bean being delivered to government produce inspectors prior to forwarding to exporters, grading is done instead by the exporters themselves and then inspected, though only on a sample basis, by produce inspectors at the exporter's shed. The system proposed here is essentially the same as that of Perkins and Clarke, though Figure 3 makes clearer the full range of alternative outlets open to growers. An important element here is that there would be no requirement that an entrepreneur establishing a fermentary at village level must have any cocoa trees of his own, let alone a required minimum of 5,000. This would correspond to, say, cotton ginning in other countries, where one does not need to grow cotton in order to set up a cotton ginnery. At the same time a small-scale fermentary owner would often be a producer himself, but tap economies of scale by purchasing from other growers. In some cases a grower would own his fermentary without purchasing from other growers, and sell his dry bean directly to a dealer or exporter. It would remain open to groups of growers to form a business group or cooperative, but this would face greater competition now from village dealers, i.e. growers with their own fermentaries licensed to buy wet beans from others or village entrepreneurs who have established facilities.

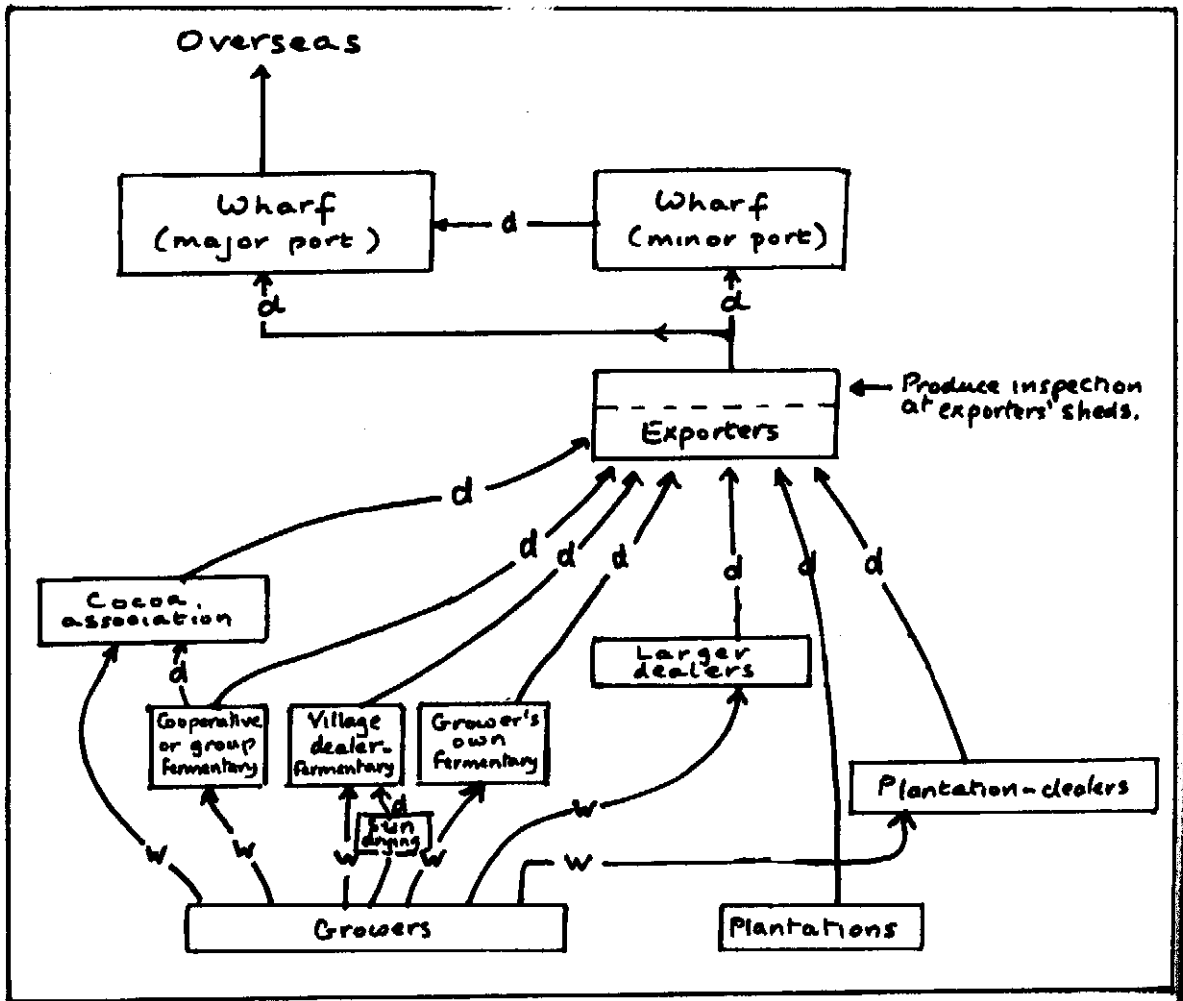
Figure 2

Cocoa marketing system proposed by Perkins and Clarke



Source: Perkins and Clarke (1980).

Figure 3
Proposed system of cocoa marketing and processing
with maximum range of alternatives



Note: W = movement of wet bean; d = movement of dry bean.

Such cooperative groups might be established under an umbrella cocoa association along the lines of SCGA or Lus Development Corporation in East Sepik. Dry bean could be delivered by any of these processors, as now, directly to an exporter : but alternatively, since trading in dry bean would be authorised, village-level processors could instead sell dry bean to larger dealers who would bulk this for transshipment to exporters. The system as depicted would maximise the range of alternatives open at different stages and also provide maximum scope for bulk-building to economise transport costs. It would significantly increase the proportion of cocoa transported as dry bean, while retaining fermentary labels on every dry bean sack consigned.

Since the proposals above imply approval of relatively free entry into processing, it is necessary to draw attention to the already exceptionally high rate of turnover among fermentaries in East New Britain, where licensing has been most liberal (Table 43). Among fermentary-dealers in the Gazelle, based on the evidence of eight years, 21 per cent survived only one or two years, though these would be larger establishments than those without dealer licences for buying wet bean. Among ordinary fermentaries in the Gazelle, 46 per cent survived only one or two years. These proportions were substantially lower, but still high, outside the Gazelle area. Of those fermentary/dealers and fermentaries in existence in the Gazelle in 1979/80 only 56 and 17 per cent, respectively, functioned in 1987/88. Again, corresponding figures for the non-Gazelle area were higher. This high level of instability does not appear to have been commented on elsewhere - not even, surprisingly, in the recent report of the Cocoa Industry Investigating Committee, despite its obvious potential implications for quality and the general state of the industry - and it is clearly desirable that the causes underlying this phenomenon be investigated more closely than we have been able to do here. The most plausible explanation is that ownership of a fermentary has prestige or convenience value rather than purely economic return. Closer extension advice to those contemplating investment in processing as well as monitoring of outstanding investments appears to be called for.

Table 38
Unit costs of production by size of fermentary,
Gazelle Peninsula, East New Britain

Costs (kina/tonne)	Small village fermentary	Co- operative	Medium- sized enterprise	Large entre- preneurial unit	Large managerial firm
Transport costs	50.37	42.27	23.88	12.77	43.60
Labour costs	80.41	187.85	81.30	54.78	131.74
Managerial costs		52.76			89.64
Depreciation	16.27	23.63	8.06	13.27	16.15
Interest	2.91	29.95	9.83	1.44	13.77
Processing costs	44.86	37.22	18.68	25.24	83.64
Total costs	194.82	373.68	141.75	107.50	379.56
Output (tonnes p.a.)	15.00	27.50	36-200 (mean 104)	500.00	1000.00

Source: Morley (1986)

Table 39
Breakdown of unit costs of production by size
of fermentary, Gazelle Peninsula

Costs (kina/tonne)	Small village fermentary	Co- operative	Medium- sized enterprise	Large entre- preneurial unit	Large managerial firm
Transport costs					
PMV Hiring costs	50.37	-	-	-	-
Vehicle depec'n	-	22.68	6.68	6.95	17.44
Petrol	-	19.59	17.20	5.82	26.14
Labour costs					
Family labour costs	62.93	-	-	-	-
Cash wages	17.48	187.85	79.30	54.78	131.74
Food	-	-	2.00	-	-
Managerial costs					
Manager	-	52.76	-	-	-
Managerial expenses	-	-	-	-	79.64
Office costs	-	-	-	-	11.02
Depreciation					
Drier depec'n	15.60	20.90	5.05	6.95	13.22
Fermentary depec'n	0.67	2.73	2.23	0.74	2.75
Grader depec'n	-	-	0.78	0.30	0.18
Generator depec'n	-	-	-	5.28	-
Interest	2.91	29.95	9.83	1.44	13.77
Processing costs					
Drier repair	6.63	4.22	1.68	1.16	2.75
Drier fuel	21.23	-	-	7.08	22.03
Bags/twine/ink	17.00	17.00	17.00	17.00	17.00
Winnowing	-	16.00	-	-	-
Electricity	-	-	-	-	41.86
Total costs	194.82	373.68	141.75	107.50	379.56

Source: Morley (1986).

Table 40
Deliveries of cocoa from East Segik fermentaries to Newak, 1982-87, tonnes
(with amounts of non-export, nibs and residue)

	1982	1983	1984	1985	1986	1987	1982-87	Proportion of non-export nibs, residue (per cent)
Larger fermentaries								
Segik Cocoa Growers	18430 (-)	19805 (-)	19924 (-)	25053 (11)	24517 (218)	16536 (83)	124265 (312)	0.3
Valelowan	2129 (27)	905 (42)	2224 (76)	3709 (65)	2920 (26)	2686 (19)	14573 (255)	1.7
But-Bolken	1671 (-)	1824 (32)	247 (-)	4186 (243)	1082 (95)	-	9010 (370)	4.1
St. Anna	53	-	-	-	29 (29)	446 (25)	475 (54)	11.4
Lus Development Corp.	-	-	-	-	-	n.a.	n.a.	
Total, larger fermentaries	22283 (27)	22534 (74)	22395 (76)	32948 (319)	28548 (368)	19668 (127)	148323 (991)	0.7
Smaller fermentaries								
Yangoru	-	221 (34)	161 (13)	350 (11)	-	370 (20)	-	
Angoram	-	-	-	513 (27)	1001 (33)	944 (34)	2458 (94)	3.8
G. Wamei	-	-	-	-	328 (-)	765 (6)	1093 (6)	0.5
Bivan	-	-	-	-	280	37 (1)	317 (1)	0.3
Torumba	-	-	-	-	-	191 (4)	191 (4)	2.1
Mumugu	-	-	-	-	-	68 (-)	68 (-)	-
Gavien	-	-	-	-	-	24 (-)	24 (-)	-
Kinsim	-	-	-	-	-	88 (2)	88 (2)	2.3
Total, small fermentaries	-	221 (34)	161 (13)	863 (38)	1609 (33)	2487 (67)	5341 (107)	2.0
DAL fermentaries (including West Segik)								
Nukvunglo	-	-	-	-	-	70 (11)	70 (11)	15.7
Poro	-	-	-	-	-	140 (10)	140 (10)	7.1
Pael	-	-	-	-	-	18 (-)	18 (-)	-
Tumi	-	-	-	-	-	100 (1)	100 (1)	1.0
Total, DAL fermentaries	-	-	-	-	-	328 (22)	328 (22)	6.7

Table 41
Trends in Cocoa Board export gradings
1978/79 to 1987/88

Year	Total all grades (t)	Export (t) (%)	Non- export (t)	Nibs (t)	Residue (t)	Total excl. export (t) (%)
1978/79	27,891	26,137 93.7	863	281	610	1,754 6.3
1979/80	30,768	28,432 92.4	1,309	259	768	2,336 7.6
1980/81	27,123	25,700 94.8	778	193	452	1,423 5.2
1981/82	29,303	28,119 96.0	393	268	523	1,184 4.0
1982/83	29,410	28,115 95.6	388	262	645	1,295 4.4
1983/84	28,969	27,601 95.3	559	227	581	1,367 4.7
1984/85	32,644	31,352 96.0	421	288	583	1,292 4.0
1985/86	35,013	33,420 95.5	550	326	717	1,593 4.5
1986/87	39,966	38,862 97.2	468	334	302	1,104 2.8
1987/88	34,025	32,767 96.3	440	308	510	1,258 3.7

Source: Report of the Cocoa Industry Investigating Committee, 1987;
DAL (1987/88)

Table 42
Yearly cocoa production by grade, 1987,
plantations and smallholders

		Export quality	Non-export and residue	Total
Plantations	No. of bags	64,510	3,819	68,328
	per cent	94.4	5.6	100.0
Smallholders	No. of bags	102,030	338	102,368
	per cent	99.7	0.3	100.0

Source: As Table 41.

Table 43

Survival rates among cocoa fermentaries and fermentary-dealers in East New Britain

Year	Fermentary-dealers			Fermentaries only			All fermentaries and fermentary-dealers		
	No. in existence or established during year	Proportion surviving until 1987/88 (%)	No. in existence or established during year	Proportion surviving until 1987/88 (%)	No. in existence or established during year	Proportion surviving until 1987/88 (%)	No. in existence or established during year	Proportion surviving until 1987/88 (%)	
	Gaz.	Non-Total	Gaz.	Non-Total	Gaz.	Non-Total	Gaz.	Non-Total	
					</				

Notes:

Data excludes plantations and plantation-dealers. Gaz = Gazelle; Non-Gaz = East New Britain excluding Gazelle. A proportion of those in existence in 1979/80 would have been established earlier. A few dealing in subsequent years may have also operated prior to 1979/80. Those deemed to have survived in 1987/88 are those trading in that year; a few might re-enter in subsequent years. Only a proportion of those surviving traded in every year during the period; many traded only in some of the years. By definition the survival rate of those opening for business in the last year will show a 100 per cent survival rate.

Table 44
Market shares in the export of cocoa, 1984-87

	1984		1985		1986		1987		Average market share 1984-87 per cent
	tonnes	per cent	tonnes	per cent	tonnes	per cent	tonnes	per cent	
Ango	17,272,260	54.0	15,874,602	55.6	14,288,060	49.5	17,275,763	54.7	53.5
New Guinea									
Cocoa	8,281,001	25.9	10,027,875	35.1	11,430,000	39.6	7,447,875	23.6	30.7
Rabtrad	5,843,066	18.3	2,320,191	8.1	3,102,807	10.7	6,218,180	19.7	14.4
B.M.C.	247,289	0.8	-	-	-	-	482,191	1.4	6.0
Mt. Lamington									
U.C.	60,000	0.2	-	-	-	-	-	-	0.0
Itelek	-	-	202,000	0.7	61,000	0.2	180,000	0.5	0.4
Anisa Com.m.									
Traders	295,000	0.9	145,000	0.5	-	-	-	-	0.4
Plantations									
Kulon	650,000	-	937,125	-	720,000	-	1,700,000	-	-
NSPDC	360,000	-	475,000	-	310,000	-	357,500	-	-
Pacific T. C.	560,000	-	445,000	-	545,000	-	635,000	-	-
NGIP	-	-	-	-	52,500	-	-	-	-
Total incl. plantations	33,568,616	-	30,426,793	-	30,509,367	-	34,296,509	-	-
Total excl. plantations	31,998,616	100.0	28,569,668	100.0	28,881,867	100.0	31,604,009	100.0	100.0
Two largest exporters	-	79.9	-	90.7	-	89.1	-	78.3	84.2
Three largest exporters	-	98.2	-	98.8	-	99.8	-	98.0	98.6

Chapter 8

MARKET STRUCTURE IN THE COCOA TRADE

The general structure of the cocoa industry may be pieced together from the comments already made. The export level is dominated by a small number of exporting companies, one, in particular, a nationally-owned company, Angco, accounting for some 55 per cent of exports (Table 44) and the other two sharing another 43-44 per cent between them, though their relative positions have fluctuated between years. Together, though, the three companies accounted for 98 per cent of exports in 1987. Altogether exporters operated 24 buying points in 1985-86.

As noted earlier (Table 7) the three companies do not have an equal presence in every cocoa producing area within Papua New Guinea, so that the degree of concentration in particular areas may be even greater than this. In Madang, for example, the market is shared between Angco and Rabtrad only. In Oro Province the financial collapse of Mt. Lamington United Cocoa led to a major crisis, with wet beans rotting at the roadside, until Angco was persuaded to come in.

Itelek is a relatively recent entrant to the industry and is still very small. Other previous entrants - including the Sepik Cocoa Growers Association - have made little headway. Success in the export business requires substantial capital, overseas contacts and some degree of experience, given the volatility of prices. Itelek is essentially an agent for a new overseas buyer who supplies capital for crop finance and an expatriate manager on a management contract.

The Cocoa Board has generally been reluctant to license new exporters and a standing policy exists that the present number of exporters is sufficient. This makes sense in terms of discouraging involvement by companies which lack the obvious substance required for successful operation at this level. What is clearly required, however, is rather energetic encouragement of entry by qualified companies in order to provide some healthy competition, to the benefit of the grower.

While the market share of the leading exporter has been fairly constant, the absolute quantities of cocoa exported by the first three companies have fluctuated from year to year. One of the three, for instance, experienced a 35 per cent fall in tonnage handled between 1986 and 1987. The firms themselves allege that competition at the export level is intense, in terms of competing for volume. This would certainly provide a motive for competition, given relatively high overheads and low marginal costs in cocoa handling. Alternatively this may be viewed as mere passive acceptance of fluctuations in share with fluctuations due to factors outside the firms' control, such as opportunities for overseas contracts. But since the data covers performance over a full year this is less likely. It is reasonable to suppose, therefore, that there is some element of competition among exporters, price or non-price, for volume, notwithstanding the high degree of concentration.

With respect to price competition, price flexibility in the cocoa industry will be examined presently, when some econometric results are presented. It is worth looking first at price variation as between the three exporters (Table 45). The average of the mean daily delivered-into-store prices paid by the three exporters during the month was calculated for each month during 1987, as a sample year, together with the monthly average of daily deviations of the price paid by each company from the mean.

The percentage deviations from the mean price were generally low, not exceeding one per cent in 24 out of 36 cases (twelve months times three companies). The monthly average of the daily difference between the highest and the lowest price offered by the three companies was between 2 and 5 per cent of the monthly average price in practically all the months. It may be concluded that there is a considerable degree of price stability between exporters at the export level, in the sense of prices moving up and down together, though the common level of prices is variable.

One pricing phenomenon at the export level which is not easily explained is the variation between exporters in the difference between prices paid at main port, Rabaul, and subsidiary port, Wewak in the case examined (Table 46). While one exporter pursues a policy of uniform pricing at all Papua New Guinea ports (ignoring costs of transshipment from subsidiary ports), another pays a higher price at the main port, as one would expect, and the third a lower price, usually, though not always, at the main port.

Non-price competition would mean particularly competition in the provision of crop finance to fermentary/dealers, together with forward contracts for the delivery of produce. It was not possible to secure accurate data on the quantitative importance of trade credit. This importance has been reduced in recent years as a result of negative experience with repayment. Two of the leading exporters reported default rates of 25 per cent in one case and 15-20 per cent in another, followed by the adoption of more cautious policies. The larger cocoa dealers in Rabaul are able to obtain finance from exporters on a regular basis but access to finance is less common among small fermentaries outside the main town. The Cambridge study (Morley 1986) found that most fermentaries stated they ran out of cash at some time in the year, i.e. in the flush, and that for some this seemed to be a continual problem. In contrast "the big firms can and do borrow from their exporters, and corner the market during the flush."

Below the export level the composition of the cocoa industry varies in nature between the different cocoa-producing areas of Papua New Guinea, though East New Britain and East and West Sepik offer representative contrasts.

Some historical background is required in order to appreciate the situation in East New Britain. Cocoa there was developed under the Tolai Project, which commenced in the mid-1950s and for a long period under the early 1970s enjoyed a monopoly of purchase. This was a cooperative marketing organisation promoted by the Department of Primary Industry. It was up and down financially and eventually faced bankruptcy, due to poor and frequently changing management and over-ambitious diversification into other activities and the fact that it paid only 50 per cent cash at time of purchase. This made way for the establishment of the New Guinea Islands Produce Company (NGIP) which grew out of the Project, taking over its assets. It has some 4,500 shareholders, not necessarily all cocoa growers, and pays regular dividends. One or two hundred normally attend the annual general meeting of the company. It owns 560 hectares of cocoa plantations, accounting for up to one-third of sales and providing a good base for its marketing activities. It is large enough to be able to afford high-level management.

A number of Chinese-owned businesses were engaged in the purchase of wet bean in the 1970s, but these were reduced to three when a law was introduced in late 1978 excluding non-nationals from participation in the industry. The three companies, Malaguna (previously Davaun) Trading, PilaPila and Nonga were faced with the problem of finding nationals in a position to buy them out. Similar solutions were

found in the three cases, Malaguna being bought out by groups representing seven villages, each paying K100 as deposit and subsequently repaying capital and a proportion of goodwill out of profits, the previous owner staying on as general manager. The village group distributes cash dividends among its members. At present there are six villages, embracing a few thousand people. These shareholders are not necessarily cocoa growers, the immediate locality not being particularly important for cocoa, while those villagers who grow cocoa are free to sell elsewhere and are likely to sell to the most conveniently located enterprise. Pila Pila is based on 46 different but smaller groups, comprising some 700 people in all, from four villages. There are 46 trustees representing each group and entitled to attend the annual general meeting, six trustees constituting a board of directors. Again members are free to sell their cocoa elsewhere. The original owner is again involved in management. Nonga is similarly constituted. The implication is that any monopsony profits extracted at this level of market intermediary is not necessarily associated with much income inequality: such profits would not be associated with any particular contribution to the industry, however, and the promotion of competition would be desirable if proper benefit is to accrue to the growers of cocoa themselves.

There have, in fact, been significant changes in the structure of cocoa marketing in East New Britain below the export level. The most obvious is the increase in the number of fermentaries and fermentary-dealers, the combined total rising from 317 in 1979/80 to 422 in 1987/88 (Table 47). This change masks very different variations in the number of fermentaries and the number of fermentary-dealers. The former actually declined sharply between 1979/80 and 1982/83, before rapidly increasing again thereafter to get back to its initial level at the end of the period. In contrast there was a steady increase in the number of dealers, more than doubling after 1980/81.

The opportunities open to cocoa growers for the disposal of their produce have thus changed considerably over time, the possibilities being either to process their own cocoa and sell dry bean direct to the exporter, if they are large enough growers or are able to form a business group; or to sell wet bean to a village fermentary in the vicinity, owned by a local entrepreneur; or to carry their wet bean, by PMV or local transporter, to the larger traders in Rabaul or to one of the limited number of buying points operated by them (NGIP in particular) outside Rabaul. In 1980 the three large traders other than NGIP accounted for 54 per cent of purchases; NGIP another 7 per cent; and small traders/fermentaries/own-processors together 39 per cent (Table 48). By 1986 the share of the three traders had fallen from 54 to below 33 per cent, partly because NGIP had increased its share from 7 to 20 per cent, and partly because small fermentary-dealers etc. had increased their share from 39 to 47 per cent. In 1987 the share of the three traders was down further, to 18.5 per cent, due to a further increase by the latter group. This amounts to a quite radical transformation of market structure in just seven years.

The rise of NGIP underlines the importance of management to good performance. The successful entry of another entrepreneur, Francis Giri, an independent national, outside the group of four traders, also merits mention. Factors mentioned as underlying the latter's success include the maintenance of lower overheads and the use of relatives and friends for basic labour, allowing growers to be offered a higher price, something which has met with strong response in terms of volume received. As regards the rise of small fermentaries, the complaint by one of the major traders that this has increased competition and that they "pay too high prices", so that "there is no profit any more" suggests that the changes have indeed been to the advantage of growers.

The significance of these market structure changes is that similar changes are to be expected in other regions such as East and West Sepik if the same licensing policy is implemented, as appears to be in process, affecting among other things the future of the Sepik Cocoa Growers Association. It is likely that, independently of the current financial crisis within SCGA, the dominance of this organisation (Table 49) will decline over time.

Table 45
Differences in cocoa prices paid by the three leading
exporters, East New Britain, 1987

Month	Mean DIS price paid by the exporter during month		Monthly average of daily deviations of price paid by each company from the mean of the three exporters' prices						Monthly av. of daily differ- ence between highest & lowest price offered by the three companies	
	K/t	%	Co. A		Co. B		Co. C		K/t	%
			K/t	%	K/t	%	K/t	%		
January	1496		2.7		13.2		-15.7		39	
		100		0.2		0.9		-1.0		2.6
February	1455		-20.0		9.5		11.0		41	
		100		-1.4		0.7		0.8		2.8
March	1466		-33.4		7.6		26.0		64	
		100		-2.3		0.5		1.8		4.4
April	1457		-18.3		-11.9		30.5		56	
		100		-1.3		-0.8		2.1		3.8
May	1462		8.0		-30.1		22.0		57	
		100		0.6		-2.1		1.5		3.9
June	1415		4.6		-1.0		-3.3		33	
		100		0.3		0.0		-0.2		2.3
July	1516		16.5		-9.5		-6.9		33	
		100		1.1		-0.6		-0.5		2.2
August	1443		3.6		10.7		-14.2		47	
		100		0.2		0.7		-1.0		3.3
September	1362		8.2		5.1		-13.4		31	
		100		0.6		0.4		-1.0		2.3
October	1307		11.3		-5.6		-5.6		38	
		100		0.9		-0.4		-0.4		2.9
November	1241		3.4		-22.6		18.0		56	
		100		0.3		-1.8		1.4		4.5
December	1299		0.2		-29.0		27.3		74	
		100		0.0		-2.2		2.1		5.7
Average of absolute monthly figures			10.85	0.7	12.98	0.9	16.16	1.2	47	3.4

Table 46
Differences between Rabaul and Wewak delivered-into-store
prices paid by the three leading exporters,
selected months, (K/tonne)

Day of the month	Exporter A	Exporter B		Exporter C	
	April 1985	Jly 1980	Aug. 1986	Oct. 1986	May 1986
1	20	-40	-40	50	0
2	10	-50	-60	20	0
3	0	-30	-	0	"
4	30	-30	-6	20	"
5	-	-30	-20	-	"
6	-	-30	-41	20	"
7	-	-30	-	30	"
8	-	-20	-	0	"
9	0	-35	-30	0	"
10	10	-50	-	20	"
11	30	-30	-30	-	Policy of uniform price for all PNG depots
12	30	-	-40	-	
13	-	-	-	5	
14	-	-	-35	0	
15	40	-40	-35	0	"
16	10	-35	-35	10	"
17	30	-40	-	10	"
18	0	-50	-30	-	"
19	70	-50	-30	-	"
20	-	-	-40	0	"
21	-	-40	-20	0	"
22	40	-50	-20	0	"
23	40	-	-40	0	"
24	50	-40	-	10	"
25	0	-40	-40	0	"
26	-	-20	-40	0	"
27	-	-	-20	0	"
28	-	-	-40	0	"
29	0	-20	-40	0	"
30	20	-40	-30	0	"
31	-	-50	-	-	"
Mean	23	-37	-33	8	"

Table 47
Number of registered cocoa fermentaries and fermentary-dealers in East New Britain
1979/80 to 1987/88

	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
Gazelle									
Fermentary-dealers	102	76	85	99	121	125	116	131	138
Fermentaries	123	54	32	20	26	44	85	110	106
Total	225	130	117	119	147	169	201	241	244
Non-Gazelle									
Fermentary-dealers	18	29	42	38	51	62	66	83	93
Fermentaries	74	50	45	39	49	62	76	78	85
Total	92	79	87	77	100	124	142	161	178
Total fermentary-dealers	120	105	127	137	172	187	182	214	231
Total fermentaries	197	104	77	59	75	106	161	188	191
Grand total	317	209	204	196	247	293	343	402	422
Change in Number									
of fermentary-dealers		1979/80 to 1982/83 :	+ 17	1982/83 to 1987/88 :	+ 94				
of fermentaries			-138		+132				

Source: Cocoa Industry Board registrations.

Table 48
Changes in market structure below export level,
Gazelle Peninsula, 1980-1987

	A (NGIP)	Leading Traders			Total traders	Other traders*	Total excl. plantations
		B	C	D			
1980							
No. of bags	4,090	13,558	11,416	7,200	36,264	23,301	59,565
per cent	11.3	36.2	31.5	19.9	100.0	-	-
per cent	6.9	22.8	19.2	12.1	60.9	39.1	100.0
		54.0					
1986							
No. of bags	19,374	12,768	14,232	4,480	50,854	45,684	96,538
per cent	38.1	25.1	28.0	8.8	100.0	-	-
per cent	20.1	13.2	14.7	4.6	52.7	47.3	100.0
		32.6					
1987							
No. of bags	17,106	11,105	9,585	3,648	41,444	43,912	85,356
per cent	41.0	26.8	23.1	9.8	100.0	-	-
per cent	20.0	13.0	11.2	4.3	48.6	51.4	100.0
		28.5					
Percentage increase (decrease)							
1980-87	318	(18)	(16)	(49)	14	88	43

Note: * Includes individual farmers and small fermentaries.

Table 49
Market structure in East and West Sepik : traders'
deliveries of dry cocoa, 1985 and 1986
(deliveries to Wewak only)

	1985			1986		
	No. of bags	Per cent	% non- export	No. of bags	Per cent	% non- export
Sepik Cocoa						
Growers Assoc.	25,705	72.0	0.1	29,628	77.5	0.7
Valelowan	3,586	10.0	2.0	2,921	7.6	1.0
St. Anna	101	0.3	9.9	2,253	5.9	3.7
Angoram	443	1.2	5.4	1,029	2.7	5.8
But-Boiken	4,858	13.6	6.7	972	2.5	9.8
Lus Dev. Corp.	-	-	-	745	1.9	0.8
G. Wamei	-	-	-	299	0.8	0.0
Biwan	-	-	-	288	0.8	0.0
W. G. Parer	261	0.7	0.0	105	0.3	0.0
Pasi (DAL)	-	-	-	5	..	0.0
Lumi (DAL)	-	-	-	4	..	0.0
Yangoru	131	0.4	5.3	-	-	-
Handra	594	1.7	0.0	-	-	-
Aka	3	..	0.0	-	-	-
Total	35,682	100.0	1.1	38,249	100.0	1.3

Note: 1. Figures for W. G. Parer, a substantial buyer, are misleading as the data refers only to deliveries through Wewak Produce Inspectors.

Source: Produce Inspection Reports.

Chapter 9

PRICES AND COMPETITION IN THE COCOA TRADE

The important issue is whether the market structure as it has developed in East New Britain, as the major case study area, has been translated into competitive behaviour when it comes to prices, and thus operated to the benefit of growers. Unusually the Cocoa Board maintains close records of daily prices paid by the major dealers going back to 1984 and earlier. To foster competition, moreover, the Board requires that all wet bean buyers publicly display their offered price on a blackboard at the buying point, and itself broadcasts every day the going Rabaul prices.

In order to assess price behaviour we focused on the daily prices of the four major dealers in East New Britain over the four years 1984-87. Leaving out days for which the records were unclear with respect to individual prices paid (as opposed to the average dealer price), we were left with substantial samples of 181, 232, 250 and 258 days respectively. The price behaviour of the largest dealer differed in nature from those of the others, this company generally paying a much higher price, maintaining this very stable, and changing it, when it changed it, only in large discrete steps. The three other dealers made quite frequent changes in price, independently of each other, changes, often, though not always, of just one or two toea per kilo.

It was decided not to carry out pairwise correlation of variation of price among the four dealers, in order to assess competitiveness. There are two difficulties associated with this. First, there are inevitably runs of a week or more in which no dealer changes his price, which would produce a significant degree of correlation (all prices showing zero change) even if, when changes did occur, they were unrelated. A change in one price or other occurred rather less than one day in five.

Second, if prices do move, or fail to move, together, this may be due either to competition or to explicit or tacit agreement to fix prices. It then becomes difficult to say whether independent variation in prices represents more competition or less, since a clear norm or scale is not available against which variation can be measured. Our subjective interpretation of the evidence, however, is that there is a useful degree of price competition, which one might describe as "workable competition" in the industry, although a degree of discretionary power to fix prices also exists, which may be explained by local spatial monopoly which gives each dealer some advantage in the purchase of cocoa within his immediate locality.

To support this diagnosis, the mean deviation of the dealer's daily price below that of the leading dealer was calculated for 48 months over the period 1984-87 and for the other three main dealers (Table 50), together with the annual average of the monthly figures. In 1984, for example, the annual average prices were four (approximately), six and six toea per kilogram respectively below that of the leading dealer, a substantial margin, implying very much greater divergencies on individual days, bringing out the quite different price policy being pursued by the leading dealer from the remainder. It was suggested by the other dealers that the leader's posted price might only be a nominal price, offset by variations in penalties imposed for quality (for instance by varying the assessed weight of a consignment). But the size of the differential and the apparent deliberateness of the large stepped changes made in price from time to time, suggest that we can broadly accept the posted prices as indicating actual prices paid.

Looking at the monthly data, the substantial month-to-month variations in differential do suggest a useful degree of competition. Differentials between pairs of dealers were also calculated (Table 51). Over a year Dealer B generally paid less than Dealers C and D, by one or two toea per kilogram, with C on the whole paying more than D : however, the size and even the direction of the differential varied considerably. Variations in the daily values would be much greater. As already indicated, however, the possibility of charging different prices indicates some discretionary price-fixing power which would be absent in a perfectly competitive market.

Having considered pricing at the export level, and at the large dealer level, we can turn to pricing behaviour among small village fermentaries in the rural area outside Rabaul. Information here was difficult to obtain due to the small number of fermentaries maintaining records and the patchy nature of many of the records which were maintained. It is recommended that more attention be paid to pressing small fermentaries to keep proper records and to assisting them to do so.

The performance of small village fermentaries is important. If such fermentaries are destined to take over an increasing share of the market, as suggested by current trends, it is important that they perform an efficient service, make effective use of resources, and offer growers the best price possible. If, on the other hand, they are not efficient or competitive, growers will remain dependent for a large proportion of their sales on carrying their crop in small consignments to dealers in Rabaul, incurring unnecessarily high costs of transport and obtaining lower than the full potential net grower price. The general impression, notwithstanding the advance in the market share of small fermentaries in the aggregate, is that individual fermentaries are frequently in a weak state, as borne out by the high rate of turnover observed, whether because of poor internal management or failure to achieve the necessary throughput. A number of local entrepreneurs complained of the reluctance of their fellow villagers to patronise their fermentary and thus perhaps to contribute to their emergence in wealth and status within the village, and their preference instead for selling at a lower net price, taking into account transport costs, to a large dealer in town. Another important factor, as evidenced from our questionnaire responses, is likely to be shortage of finance. This is the most obvious explanation of why fermentaries frequently drop out of the market for a few seasons, but resume later.

We were able to obtain detailed price information on five small fermentaries (Table A.1), four of these competing with each other, presumably, in the area of Gaulim. Of interest are (a) certain peculiarities of individual enterprises' pricing behaviour and (b) a comparison of local fermentary prices with those of the main dealers in Rabaul. Two fermentaries (F1 and F2, Table A.1) adopted the practice of rounding off its wet bean price to the nearest 5 toea. Thus in the course of 187 days between April 1 and December 31, the first fermentary paid 45 toea per kilogram on 129 days, 40 toea per kilogram on 54 days and 42 toea per kilogram on just four days, changing its price only seven times. The second fermentary in the same period starting on April 1 paid 45 toea per kilogram on 114 days and 40 toea per kilogram on 82 days, also changing price just seven times in nine months. One owner justified this pricing on grounds of maintaining goodwill among growers, or avoiding their hostility. But these considerations do not prevent the main dealers in Rabaul making small variations in price and in their case small variations in individual dealers' prices are considered important. The large stepped changes in price by the two fermentaries mentioned mean that substantial divergencies will occur between their prices and the average for the major dealers, which varied generally within a small range of 45 to 48 toea per kilogram.

In the case of another fermentary (F4, Table A.1), prices paid to different growers on the same day varied widely (Table 52), showing a range of 13 toea and standard deviation of 3.35 toea per kilogram, the prices here being deduced from records of amounts paid and weight of beans delivered. In some cases the lower prices were intended, legitimately, to compensate for adulteration of produce or weight of basket, but this was not considered necessary by other buyers and therefore not likely to be a principal explanation. There was evidence of growers delivering very small lots being penalised and, more reasonably, very large consignments being favoured. But for the most part the explanation appeared to be simply inaccuracy, supported by the evidence of a Ready Reckoner being employed. Surprisingly, growers did not strongly question the amounts paid out, although the fermentary in question did not attract the same custom as others in the neighbourhood and may have served as a last resort buyer.

In general, apart from some local factors, one would expect rational price-fixing among small fermentaries to produce prices closely correlated with those of the major dealers. As predicted above, the stepped price policy pursued by the first two produced major discrepancies, but this was not just in the size, but also in the direction of change. Thus in May the first fermentary cut its price by 5 toea per kilogram when the average main dealers' price was actually edging up. This was reversed in July when the latter price showed no change, with other divergences occurring in October and November. The third fermentary (F3) appeared to be adding an erratic mark-up as compared with the main dealers' price, sometimes paying more than on offer in Rabaul, despite the transport cost difference. The fourth, already identified for its variable prices between growers, also appeared to pay substantially lower prices, as much as 17 per cent lower, than its rivals. Overall there were significant differences in the average price paid and the variability over time of these prices, as measured by the standard deviation (Table 53). To test for association between prices at the first three Gaulim fermentaries and main East New Britain dealers' prices (DENB) regression and correlation calculations were made, the following regression equations being obtained, showing a very low association in all cases:

F1 =	45.0* - (t = 4.3, se = 10.45)	0.034 DENB; (t = -0.15, se = 0.23)	$R^2 = 0.0001$; n = 189; DW = 0.16
F2 =	29.5* + (t = 2.63, se = 11.23)	0.29 DENB; (t = 1.19, se = 0.24)	$R^2 = 0.007$; n = 190; DW = 0.19
F3 =	-24.2 + (t = -0.95, se = 25.33)	1.51 DENB*; (t = 2.77, se = 0.54)	$R^2 = 0.16$; n = 51; DW = 0.595**

* values significant at 5 per cent level or higher.

** adjusted for gaps in series

Inter-correlations between local village fermentary prices (Table 53) were low or negative except in the case of the first two fermentaries ($r = 0.73$) and first and third ($r = 0.57$).

The foregoing suggests that small rural fermentaries may not be very astute in determining their prices and this, if it is associated also with other aspects of entrepreneurship and additional handicaps outside their control, particularly in access to finance, would weaken their capacity to compete effectively with larger dealers. As regards pricing, it is interesting to compare a statement made in the Cambridge study (Morley 1986) also relating to East New Britain -

"One of the first things that became apparent was that there was great variation in the prices being paid by different operators. During a five day period of stability in the dry bean price, the buyers that we surveyed were paying between 34 and 48 toea per kg., with a mean of 42 toea per kg. Secondly, when fermenters were asked about the methods they used to set the price for wet beans, only two of them referred to the pressures of the market on their ability to purchase the optimum amount of cocoa."

If we turn to pricing in the Sepik provinces, we need to focus first on the Sepik Cocoa Growers Association (SCGA) which, we have seen, is in a dominant position in the cocoa trade in East Sepik particularly. Taking a representative period of 27 months from January 1984 to March 1986 only three prices were paid (at main depot), 35 toea per kilogram for the first eight months, 40 toea per kilogram for the next three, and 45 toea per kilogram for the final 16 months (Table 54). The policy pursued was thus of extreme grower price stability/rigidity. This suggests the existence of substantial discretionary power in price-fixing. In comparison f.o.b. prices received by SCGA fluctuated considerably: even monthly average figures varied widely and daily figures obviously much more so. This means that the implied SCGA margin, inclusive of all costs, also fluctuated greatly. If we compare the absolute level of the SCGA margin with that calculated for the main dealers in East New Britain (Table 54) this works out for the period 1984-86 (March) at K655.3 per tonne compared with K491.7, an excess of 33 per cent. Whether this difference is accounted for by a higher profit margin or, as more likely, by a higher level of costs, it implies a lower degree of economic efficiency. This is reflected in a significantly lower price paid to growers, ranging from 3 to 14 toea per kilogram less during the period. As indicated previously, additional costs due to transshipment from Wewak to a main port would not account for more than a two toea difference.

Certain other peculiarities of pricing policy in the area may be commented upon. With respect to SCGA, again, one would expect a lower price to be paid for cocoa purchased through buying clerks or contract buyers compared with purchases at the main depot in Wewak, due to the additional transport costs involved in purchasing away from Wewak: over the period 1983 to 1987 however, the differential varied in absolute size and from positive to negative, or zero. Lus Development Corporation, another substantial cooperative-based organisation was paying in March 1988, 40 toea per kilogram at its designated main depots, Wewak and Maprik, and 35 toea elsewhere, whereas purchases at the inland site of Maprik would involve substantial further transport costs to the coast compared with Wewak and compared with other locations nearer to Wewak for which the lower price would apply. Comparing wet bean prices paid by different fermentary-dealers in the region (Table 55) these are curiously out of line with each other and with the obviously more competitive market in East New Britain which provides a benchmark (with 2 toea subtracted) for determining what might have been the expected price in Wewak. Some of these fermentaries are in fact located outside Wewak, but generally not at great distances from the port. Parer, the

major dealer in the West Sepik area centred around Aitape appears as a "benevolent monopolist" apparently paying substantially more than the market warrants. The overall impression is of a non-competitive market, resulting in a degree of arbitrariness in the prices received by growers in different localities and over time, although the advent of new fermentaries during 1987 and 1988 appears likely to improve the situation in this respect.

We have now examined price behaviour and competitiveness at the export level, major dealer level and village level, in both East New Britain and East and West Sepik. While the situation in East and West Sepik is in transition and appears rather disjointed, that in East New Britain is more developed and perhaps represents the direction in which other regions would go as cocoa production and associated processing and marketing structures develop. It is useful, therefore, to examine the functioning of the latter structure as a whole. In a competitive marketing structure demand and price changes at the consumer or final demand level (here export level) would be directly transmitted through the system to growers, and reflected in prices payable to them. In Papua New Guinea a system of price stabilisation exists for cocoa under which in times of depressed prices a bounty is paid from the stabilisation fund and in periods of high prices a levy is deducted. Although the intended beneficiaries are the growers, it is administratively convenient to pay the bounty to the small number of exporters who, it is assumed, will pass on the higher value to dealers, and thence to growers.

To test the validity of this assumption, which assumes competition at all levels, regression equations were estimated relating the three levels of price, mean f.o.b. prices received by exporters (FOB_m and FOB_d for monthly average and daily prices respectively), exporters' delivered-into-store prices paid to dealers (DIS_m and DIS_d respectively) and the mean of prices paid to growers by major dealers in Rabaul (DEA_m and DEA_d). The differences between these prices were taken to represent the mean exporters' margin (EM_m) and mean dealers' margin (DM_m). The data used are based on daily prices available on trading days over the three year period 1985-87. The results are of importance (a) as a test of the efficiency of the market system in this area and (b) as a test of whether the purposes of the stabilisation scheme are being fulfilled, so that the bounty is being passed on to the growers and that growers' prices are thus being evened out.

For this latter purpose it makes sense to calculate in all cases monthly average prices, since a constant bounty is paid throughout each month, and since very short-term variations of price are not likely to be passed through the system : firms would wish to avoid daily changes of price, for administrative reasons and to preserve goodwill among growers.

The monthly data yielded the following regressions :

$$DIS_m = 561.7 + 0.662 FOB_m ; R^2 = 0.348, DW = 1.13 \quad (1)$$

(1.69, 4.26,*
se = 331.7) se = 0.155)

$$DEA_m = 932.2 + 0.257 DIS_m ; R^2 = 0.251, DW = 0.46 \quad (2)$$

(6.19,* 3.38,*
se = 150.6) se = 0.076)

$$DEA_m = 566.3 + 0.409 FOB_m ; R^2 = 0.506, DW = 1.14 \quad (3)$$

(3.82,* 5.90,*
se = 148.3) se = 0.069)

Covariances between variables were :

Between DIS_m and FOB_m ,	$r = 0.59$ for $n = 36$
Between DEA_m and DIS_m ,	$r = 0.50$ for $n = 36$
Between DEA_m and FOB_m ,	$r = 0.71$ for $n = 36$.

There is a significant positive relationship in all cases and, indeed, it would be surprising if there were not one. But the low values for the coefficients of determination, R^2 , indicate a not very strong relationship : there is a considerable amount of fluctuation in each of the dependent variables which is not associated with any change of the independent variable, or vice versa. The weakest relationship is between the average dealer price and the average price received by dealers, Equation (2).

It is necessary to consider for a moment what these equations imply. Equation (1) states that any change in the export price, inclusive of bounty, will produce an average change in the price paid by exporters to dealers equal to 66 per cent of that change. If bounty increases by K100, for instance, the price received by dealers will increase by K66. Equation (2) states that 26 per cent of this price change will be paid by the dealer to growers. Equation (3) states that, altogether, 40 per cent of a change in the export price (whether in bounty or the price itself) can be expected to be passed on to growers. It is evident that the third regression coefficient ought to be the product of the first two. In fact it is very different, reflecting the fact that each coefficient is an estimate subject to sampling error. The 40 per cent figure has the highest degree of reliability.

It is revealing to calculate the mean and standard deviation and, by dividing one by the other, the coefficient of variation, for each price series (Table 56). The standard deviation of the f.o.b. price excluding the bounty, i.e. the unstabilised world price, was K230.6, compared with K43.7 for the dealers' equivalent dry bean price, the growers' price, with coefficient of variation (the standard deviations as a proportion of the respective means, which is a better comparison) of 12.8 and 3.0 per cent respectively. Thus the system as a whole certainly was effective in significantly reducing fluctuations. The application of the bounty was largely, though not wholly responsible, as can be seen from the fact that the standard deviation for the f.o.b. export price including bounty was already much lower, K75.9, with a coefficient of variation of 3.6 per cent, almost as small as that of the growers' price.

External fluctuations can be cushioned also by intermediaries accepting variations in their trading margins, either exporters here or dealers. The absolute variations in size of margin, measured by the standard deviation, was approximately the same, K71.1 for the exporters' margin and K73.7 for the dealers' margin. In proportionate terms, however, the former was much more important (the dealers' margin is a much greater one, because it includes the substantial costs of processing), 44.7 per cent compared with 13.8 per cent. Variations in the exporters' margin thus makes a greater contribution to cushioning fluctuations, though both do make some contribution. We are, moreover, discussing between-month variations, and greater contributions may be made by absorbing within-month, i.e. day-to-day variations.

One might have expected, where there was some monopoly power, that the margins would vary with the size of bounty, exporters or dealers taking advantage of a higher bounty to increase their margin, rather than passing the difference on to growers.

$$DIS_d = 682.0 + (8.33)* \quad 0.604 FOB_d; \quad (15.83)* \quad R^2 = 0.249, DW = 0.25 \quad (6)$$

$$DEA_d = 983.3 + (33.99)* \quad 0.231 DIS_d; \quad (15.78)* \quad R^2 = 0.248, DW = 0.08 \quad (7)$$

$$DEA_d = 806.5 + (21.69)* \quad 0.295 FOB_d; \quad (17.03)* \quad R^2 = 0.277, DW = 0.16 \quad (8)$$

Correlation coefficients are respectively 0.50, 0.50 and 0.53, compared with 0.59, 0.50 and 0.71 obtained previously.

Let us return now to the basic equations (1) - (3) derived from the monthly data. The assumption is that if competition were perfect e.g. in the case of exporters, changes in the average monthly price are directly passed on to dealers in the same month : failure to do so would mean loss of market share to competitors. In practice, if there are short-term variations from one month to the other it may take time for exporters to decide whether there is any permanent change or change in the trend price or for competition to take effect. In the case of dealers we have noted already that there may be a reluctance to move prices to growers downwards, because of possible effects on goodwill. There may therefore be time lags in the system.

To allow for this, in part at least, it was decided to calculate moving average values for the three series concerned, these representing the trend, and to repeat the regressions. Since there is no reason to expect a seasonal cycle in the data, and therefore to take a 12-month moving average, regressions were carried out for all moving averages from 2-term to 6-term, which gave for the first equation, in order :

$$DIS_m^{2ma} = 401.8 + (1.13) \quad 0.737 FOB_m^{2ma} \quad (4.44) \quad ; \quad R^2 = 0.374 \quad (6)$$

$$DIS_m^{3ma} = 323.4 + (0.94) \quad 0.773 FOB_m^{3ma} \quad (4.81) \quad ; \quad R^2 = 0.419 \quad (7)$$

$$DIS_m^{4ma} = 394.6 + (1.21) \quad 0.740 FOB_m^{4ma} \quad (4.84) \quad ; \quad R^2 = 0.430 \quad (8)$$

$$DIS_m^{5ma} = 460.6 + (1.46) \quad 0.709 FOB_m^{5ma} \quad (4.82) \quad ; \quad R^2 = 0.437 \quad (9)$$

The highest coefficient of reliability in fact proved to be that for the 6-term moving average, just, so we may select this one and add the two other equations corresponding to this :

$$\begin{array}{lcl} \text{DIS}_m^{6ma} = & 534.3 + & 0.675 \text{ FOB}_m^{6ma} ; \quad R^2 = 0.444, \text{ DW} = 0.11 \\ & (1.78) & (4.81) \\ & \text{se} = 256.5; & \text{se} = 0.130 \end{array} \quad (10)$$

$$\begin{array}{lcl} \text{DEA}_m^{6ma} = & 583.9 + & 0.433 \text{ DIS}_m^{6ma} ; \quad R^2 = 0.278, \text{ DW} = 0.11 \\ & (2.28) & (3.34) \\ & \text{se} = 256.5; & \text{se} = 0.130 \end{array} \quad (11)$$

$$\begin{array}{lcl} \text{DEA}_m^{6ma} = & -133.4 + & 0.736 \text{ FOB}_m^{6ma} ; \quad R^2 = 0.781, \text{ DW} = 0.27 \\ & (-0.86) & (10.18) \\ & \text{se} = 154.7; & \text{se} = 0.072 \end{array} \quad (12)$$

These are estimated average relationships subject to considerable sampling error, particularly in the second case. The coefficients of determination are higher in all three cases than the corresponding equations (1), (2) and (3), so there is some improvement in the reliability of estimation. The regression coefficients for the independent variable have also increased significantly in all three cases, suggesting that there are indeed time lags which have now been picked up, so that a greater proportion of changes in price are passed on from one level to another if more time is allowed.

Thus, for changes in the export price, including bounty, 74 per cent, on average, is now estimated to be passed on to growers, compared with 41 per cent in the short run. The actual value will be within two standard errors (2×0.072) of this value 0.74, i.e. between 0.59 and 0.88. This suggests that despite the high degree of market concentration, as measured by market shares, the system as a whole exhibits a reasonable degree of competition which might be described as "workable competition". Secondly, since the coefficient relating exporters' DIS price to exporters' FOB price, 0.675, is much greater than that relating the price received by dealers to that paid out by them to growers, 0.433, we may conclude that competition is rather weaker and discretionary pricing power greater among dealers than among exporters.

Table 50
Mean monthly deviation of three dealers' daily prices below
that of the leading dealer, East New Britain, 1984-87

Year Month		Sample size N	Mean price deviation (t/kg) of dealer			Month		Sample size N	Mean price deviation (t/kg) of dealer		
			B	C	D				B	C	D
1984	J	16	3.5	4.9	1.8	1986	J	21	6.0	6.8	5.7
	F	11	-2.5	5.0	1.9		F	28	3.7	4.9	3.4
	M	13	0.0	5.0	0.0		M	12	1.0	3.8	2.0
	A	9	10.0	7.0	7.0		A	21	3.7	6.9	6.9
								(n=10)			
	M	9	5.0	3.0	2.0		M	22	7.7	7.3	5.9
	J	11	5.5	7.1	6.8		J	19	3.8	1.8	1.8
	J	16	3.0	6.0	8.0		J	21	5.3	4.3	3.1
	A	14	7.0	9.0	14.3		A	21	4.8	3.6	1.3
	S	19	7.0	7.9	7.7		S	21	5.0	4.7	4.0
	O	23	4.6	4.8	5.3		O	23	4.0	3.8	3.3
	N	24	2.0	5.8	5.3		N	20	8.1	8.5	8.5
	D	16	2.0	6.0	10.0		D	21	3.0	4.0	4.0
1984	Yr	181	3.8	6.0	6.0	1986	Yr	250	4.8	5.1	4.2
								(n=239)			
1985	J	23	2.0	4.0	5.3	1987	J	20	3.0	4.0	4.0
	F	10	4.0	6.0	4.4		F	20	3.0	4.0	3.7
	M	19	5.6	6.3	6.2		M	22	3.0	4.0	4.0
	A	14	3.8	4.7	4.5		A	22	3.0	3.5	3.5
	M	22	6.0	7.0	7.0		M	21	3.0	4.7	3.4
	J	18	2.3	3.4	4.0		J	21	3.0	6.0	4.5
	J	22	2.0	1.9	3.9		J	24	3.0	5.4	6.0
	A	22	1.0	2.5	3.0		A	21	3.0	5.3	6.0
	S	18	1.0	2.7	2.1		S	21	4.0	6.1	5.9
	O	23	1.2	3.2	2.2		O	23	5.5	6.4	5.0
	N	20	0.0	2.0	-1.0		N	21	5.2	6.6	4.6
	D	21	3.4	4.1	2.8		D	22	5.5	7.5	5.4
	1985	Yr	232	2.6	3.9		3.7	1987	Yr	258	3.7
1984-87	921	3.7	5.0	4.7							
		(n=910)									

Table 51
Mean monthly deviation in daily prices paid to growers
between pairs of dealers, East New Britain, 1984-87

Mean price deviation between pairs of dealers, toea/kilogram												
Month	B - C				B - D				C - D			
	1984	1985	1986	1987	1984	1985	1986	1987	1984	1985	1986	1987
J	1.4	-2.0	-0.8	-1.0	1.7	-3.3	0.3	-1.0	3.1	-1.3	1.1	0.0
F	-7.5	-2.0	-1.2	-1.0	-4.4	-0.4	0.3	-0.7	3.1	1.6	1.5	0.3
M	-5.0	-0.7	-2.8	-1.0	0.0	-0.6	-1.0	-1.0	5.0	0.1	1.8	0.0
A	3.0	-1.9	-3.2	-0.5	3.0	-0.7	-3.2	-0.5	0.0	0.2	0.0	0.0
M	2.0	-1.0	0.4	-1.7	3.0	-1.0	1.8	-0.4	1.0	0.0	1.4	1.3
J	-1.6	-1.1	2.8	-3.0	-1.3	-1.7	2.0	-1.5	0.3	-0.6	0.0	1.5
J	-3.0	0.1	1.0	-2.4	-5.0	-1.9	2.2	-3.0	-2.0	-2.0	1.2	-0.6
A	-2.0	-1.5	1.2	-2.3	-7.3	-2.0	3.5	-3.0	-5.3	-0.5	2.3	-0.7
S	-0.9	-1.7	0.3	-2.1	-0.7	-1.1	1.0	-1.9	0.2	0.6	0.7	0.2
O	-0.2	-2.0	0.2	-0.9	-0.7	-1.0	0.7	0.5	-0.5	1.0	0.5	1.4
N	-3.8	-2.0	-0.4	-1.4	-3.3	1.0	-0.4	0.6	0.5	3.0	0.0	2.0
D	-4.0	-0.7	-1.0	-2.0	-8.0	0.6	-1.0	0.1	-4.0	1.3	0.0	2.1
Yr.	-2.2	-1.3	-0.3	-1.6	-2.2	-1.1	0.6	-1.0	0.0	0.2	0.9	0.6

Table 52
Prices paid to different growers on the same day
(3 June 1987) by a small fermentary,
Gaulim, East New Britain

Apparent price paid (toea/kg)	33	34	35	36	37	38	39	40	41	42	43	44	45	46
No. of purchases at these prices	4	3	1	2	6	1	2	12	3	10	1	-	1	2

Table 53
Inter-correlations between local fermentary prices,
Gaulim¹, East New Britain

Variable	Means and standard deviations		
	Mean (Kina)	Standard deviation (Kina)	Coefficient of variation (per cent)
Dealers' prices, ENB (DENB)	46.3	0.7	1.6
Price at fermentary 1 (F1)	43.5	2.3	5.3
Price at fermentary 2 (F2)	42.9	2.5	5.8
Price at fermentary 3 (F3)	45.8	2.9	6.3
Price at fermentary 4 (F4)	37.9	1.3	3.4
Price at fermentary 5 (F5)	45.4	0.6	1.2
Inter-correlations			
DENB and F1	$r = -0.01$	(n = 189)	
DENB and F2	$r = 0.09$	(n = 190)	
DENB and F3	$r = 0.40$	(n = 42)	
DENB and F4	$r = 0.07$	(n = 51)	
DENB and F5	$r = 0.22$	(n = 149)	
F1 and F2	$r = 0.73$	(n = 189)	
F1 and F3	$r = -0.27$	(n = 42)	
F1 and F4	$r = 0.26$	(n = 51)	
F1 and F5	$r = -0.30$	(n = 149)	
F2 and F3	$r = 0.57$	(n = 42)	
F2 and F4	$r = -0.45$	(n = 51)	
F2 and F5	$r = -0.06$	(n = 149)	
F3 and F4	$r = 0.22$	(n = 12)	
F3 and F5	$r = 0.00$	(n = 30)	

Note: 1. Fermentary 5 is not in Gaulim but located nearer to Rabaul.

Table 54
F.o.b. prices received and dry bean equivalent prices paid by Sepik Cocoa Growers Association (SCGA), 1984-86 (March)

Year/ Month	Approx. f.o.b. prices rec'd by SCGA based on contracts rec'd (mean of contracts during month) (K/tonne)	SCGA wet bean price at main depot (tonne/kg)	Rabaul dealers' mean price (tonne/kg)	Dry bean equiv. of wet bean price paid by SCGA at main depot, monthly average (K/tonne)	Implied SCGA margin, monthly average (K/tonne)	Comparable dealers' margin in Rabaul, monthly average (K/tonne)
1984						
J	1872.5	35	46.4	1125	747.5	586.1
F	1902.5	35	49.1	1125	777.5	364.4
M	1954.7	35	47.0	1125	829.7	489.2
A	1837.2	35	44.3	1125	712.2	511.2
M	2025.6	35	46.0	1125	900.6	733.8
J	2060.0	35	46.0	1125	935.0	542.1
J	1824.0	35	45.2	1125	699.0	406.6
A	1840.0	35	46.4	1125	715.0	526.2
S	1975.0	40	49.5	1250	725.0	532.2
O	1806.7	40	49.4	1250	556.7	350.8
N	1812.0	40	47.1	1250	562.0	420.5
D	-	45	46.0	1375	-	379.7
Annual average	-	-	-	-	741.8	443.1
1985						
J	1800.0	45	47.2	1375	425.0	584.0
F	1815.0	45	49.0	1375	440.0	643.0
M	1927.9	45	50.2	1375	552.9	500.0
A	2018.8	45	50.2	1375	643.8	432.0
M	2060.8	45	50.0	1375	685.8	427.0
J	2002.5	45	48.0	1375	627.5	485.0
J	1890.8	45	47.7	1375	515.8	527.0
A	1989.3	45	48.3	1375	614.3	524.0
S	1937.7	45	49.0	1375	562.7	566.0
O	2018.8	45	49.0	1375	643.8	486.0
N	1992.8	45	49.0	1375	617.8	542.0
D	2011.0	45	50.5	1375	636.0	596.0
Annual average	-	-	-	-	580.5	526.0
1986						
J	2060.0	45	51.0	1375	685.0	633.0
F	1997.5	45	50.7	1375	622.5	499.0
M	1980.0	45	48.7	1375	605.0	514.0
Av. for quarter	-	-	-	-	637.5	548.7
Av. for quarter	-	-	-	-	655.3	491.7
Av. for quarter	-	-	-	-	655.3	491.7

Table 55

Net bean prices paid by different intermediary-dealers,
East and West Sepik, November 1986 - March 1988

Year/ Month	Mean daily price paid by main Rabaul dealers	Price paid by SCGA at central depot & elsewhere	Lus Dev. Corp. main depot & elsewhere	W & R Parer	Yangoru intermediary	Torumba	Simitap
(tosa/kilogram)							
1986	N	47.9	50/40-45	55	-	-	-
	D	47.0	50/40-45	55	-	-	-
1987	J	47.0	50/40-45	55	-	-	-
	F	47.0	50/40-45	55	-	-	-
	M	47.0	50/40-45	55	-	-	-
	A	47.6	50/40-45	55	-	-	-
					- } 40 }		
	M	47.3	50/40-45	55	50/45	-	-
	J	46.2	50/40-45	55	50/45	-	-
	J	46.0	50/40	55	50/45	-	-
	A	46.0	50/40	55	45/40	-	-
	S	46.0	40/30-40	55	45/40	50*	-
	O	45.4	40/30-40	55	45/40	50*	-
	N	46.0	40/30-40	55	40/35	50*	-
	N	46.2	40/30-30	55	40/35	50*	-
	D						
	J	-	40/40	55	45/40	40	-
	F	-	50/40	55	30 } 40 }	40	40
	M	-	n.a.	55	40 }	n.a.	40

Table 56
Mean and standard deviation of monthly average and
daily cocoa prices, East New Britain, 1985-87

	Mean (K/ tonne)	Standard deviation (K/tonne)	Coefficient of variation (sd/x) (per cent)
Monthly data			
F.o.b. export price, excl. bounty	1807.9	230.6	12.8
F.o.b. export price, incl. bounty	2134.2	75.9	3.6
Exporters' DIS price	1974.8	85.2	4.3
Dealers' equivalent dry bean price	1440.0	43.7	3.0
Exporters' margin	159.2	71.1	44.7
Dealers' margin	534.8	73.7	13.8
Daily data			
F.o.b. export price, incl. bounty	2142.6	79.6	3.7
Exporters' DIS price	1976.7	96.4	4.9
Dealers' equivalent dry bean price	1439.3	44.6	3.1

Source: Data in Table A.3.

Chapter 10

COOPERATIVES AND BUSINESS GROUPS

The lack of bulk-building in the marketing system, particularly in new cocoa producing areas where individual holdings and consignments are small, suggests that the formation of groups or cooperatives, able to assemble bulk deliveries, would be a good solution. In such areas, also, the lack of independent entrepreneurs in a position to provide the required marketing services, points to some kind of joint village action.

In fact, though historically important in the development of cocoa, cooperatives and groups in Papua New Guinea as a whole were in apparent decline over a number of years, the proportion of the smallholder crop processed by group companies and large cooperatives falling from 65 per cent in June 1968 to 19 per cent in May 1977. Over the last decade their share seems to have stabilised (Table 57).

It is necessary in discussing the cooperative marketing of cocoa in Papua New Guinea to distinguish between large cooperative companies, which may also be "umbrella" organisations embracing a large number of separate village groups, and smaller independent cooperatives or "business groups". Among the former are the New Guinea Islands Produce Company, which developed out of the Tolai Cooperative Project in East New Britain but which operates very much along the lines of an ordinary commercial company, with strong, independent management, and the Sepik Cocoa Growers Association (SCGA) which pioneered the development of cocoa in East Sepik. As we have seen in our discussion of Malaguna, PilaPila and Nonga trading companies in East New Britain some groups were formed essentially as a vehicle for transferring ownership of previously overseas-owned trading enterprises and are not marketing cooperatives in the usual sense of marketing the produce of cooperative members themselves. Dissatisfaction with the functioning of small rural cooperatives led to a Commission of Enquiry into Cooperatives, reporting in 1973, and thence to changes in legislation in 1974 when many active cooperatives were registered now as "cooperative companies" under the Companies Act. Associated with this was the registration of "business groups", generally based on customary or clan groupings, but legally recognised as company-type corporations. The use of the term "cooperative" is now actively discouraged and has acquired negative connotations among the growers themselves, and most new operations are launched under the designation of a business group. Whether this is the correct approach may be considered briefly here.

Within our survey, households were asked whether they did in fact sell their cocoa or copra separately as individuals or as part of a group (Table 58). The percentages selling separately were, respectively, 82 and 89 per cent. The incentive to sell through a group is greater with cocoa where individual consignments are small and more perishable compared with copra where individuals find it easier to accumulate a sufficiently large number of sacks to fill or half-fill a vehicle.

To assess current attitudes growers were asked whether they considered it "a good idea" to form a business or family group or a cooperative (Table 59). The switch of preferences is indicated by the fact that 75 per cent responded positively in the case of business groups, compared with just 40 per cent for cooperatives. Significantly the negative assessment was greatest in East New Britain, 78 per cent compared with 55 per cent elsewhere, where there has been the longest experience of cooperatives. Since closer examination of some of the business groups in the field revealed them to

be cooperatives, essentially, based on memberships of 60, 80 or a 100 growers very often, a further question was asked to discover whether their liking or dislike of cooperatives was at least based on a clear appreciation of the difference between the two. Of those answering just under half did have a correct understanding (Table 60). This is encouraging, even if at the same time a substantial proportion were not able to identify the difference. The most important negative objections to cooperatives stood out clearly enough (Table 61) as "mismanagement" (55), "conflict of interest among those involved" (43), "too many people involved" (40), "independent effort and reward preferable" (17) and "failure of past experience locally" (15). The fact that the reasons for taking a negative view of business groups were less frequently specified (Table 62) itself suggests that this view was less strongly felt. No individual reason stood out either, as was the case with cooperatives.

Before commenting on appropriate policy towards smaller cooperatives and groups, we need to consider what has been the experience of the major cooperative associations, in particular SCGA. The experience of the SCGA is of special relevance where, as in many developing cocoa areas of Papua New Guinea, the problem is to promote and accelerate the expansion of cocoa in areas where production is still embryonic. As a brief history of the company recalls (SCGA 1982) the Association was initiated by growers "with the basic aim of providing marketing facilities for the large population of cocoa growers who produced insufficient quantities of cocoa beans to carry out their own individual fermenting and drying."

The basic structure of the SCGA is of a central organisation supported by a large number of village-based or clan-based units. Each clan elects its representative to serve on the board of directors of the Association, which as a result currently (in 1988) has 39 directors. One director may represent two or three villages or, if they are small or sub-villages, seven or eight. Growers may deliver their cocoa directly to the central depot in Wewak or to buying clerks at the sub-depots of Urip and Handara; or the village groups may assemble produce for roadside buying in the villages by the buying clerks or contract buyers. The clerks follow a given itinerary for the collection of wet bean, with the villages visited weekly or fortnightly in fixed sequence at some 300 separate buying places, over an extensive region in both provinces, coastal and inland.

At one time the SCGA had 130 contract buyers in place, comprising 80 groups and 50 individuals. A large proportion, however, never operated, or dropped out quickly. In 1985 only 6 of the 50 individuals remained. These were people with their own vehicles and finance for crop purchase. In the case of groups, these would aim to cover their own area first, but to purchase from neighbouring villages if asked.

Two aspects of the original establishment of the Association need to be noted: first, that it depended on promotion and assistance by the Divisions of Primary Industry and Business Development, and second that it was based on the simultaneous mobilisation of a substantial number of villages, meetings being held in the villages to gain acceptance and to collect membership fees of K10 per share, to form the share capital of the Association. This was registered in October 1973, with drying and fermenting operations commencing in June 1974. With the establishment in this way of a processing and marketing infrastructure, turnover increased rapidly until 1979. Problems then arose as established processing capacity could no longer cope with the volume offered and, despite establishment of additional fermentaries at Urip and Handara in 1979, management problems led to a substantial proportion of volume being rejected for export in early 1980, leading to a loss of K140,000 in the financial

year. Recognition of the critical importance of management led to the appointment of a new, experienced general manager, which brought improvement.

The status of the Association as a cooperative under the Cooperative Society's Ordinance was also considered a handicap in securing credit and, in July 1981, it was registered as a limited company. In 1982 this had more than 5,000 shareholders and about 18,000 associated cocoa growers in East and West Sepik. In 1981 a subsidiary company was established, Sepik Cocoa Growers Exports Pty. Ltd., which ran additional businesses. Only once, however, did it attempt to enter the export trade, exporting just 105 tonnes in 1983. Generally the Association has exported via Angco in Lae, New Guinea Cocoa in Rabaul, or Rabtrad in Madang. It seems advisable that the Association, and any counterparts elsewhere which may be established, should steer clear of the export business as this only imposes further strain on limited managerial capacity and requires international contacts and knowledge of a volatile overseas market. With Angco now established in Wewak and purchasing dry bean from other fermentaries as well, this appears even less necessary.

Though the number of associated growers has continued to increase, and was estimated as between 30,000 and 40,000 in early 1988, managerial and financial problems have multiplied, culminating in a forced temporary closure early in the year. At this time records and accounts were in a poor state and the company appeared to lack the staff and organisation required for the goals set.

One factor has been the size of the board, with 39 members, too unwieldy for decision-making. As noted previously, pricing by Sepik Growers has not moved in line with prices in East New Britain, which follow more closely world market demand. Given SCGA's dominant position in the market and its role of price leadership, this mis-pricing has wider consequences. Political interference with decision-making has also occurred, making it difficult for the manager to reduce his price in line with prices being received. Thus during 1987 Sepik Growers were buying at K1,500 per tonne and selling at K1,350 per tonne for about six months, precipitating the crisis which followed. Similarly directors have insisted on the payment of rebates (dividends) when these were not warranted by the financial performance achieved.

Allowances paid to directors for attendance at meetings have imposed a significant burden. With allowances of K229 and K191 for the chairman and vice-chairman respectively, and K60-80 for directors, an attendance of 30 implies a cost of some K2,500 per meeting. Since fifteen meetings were held during 1987, total charges may have amounted to K30-40,000 (US\$50-60,000).

One should mention other influences associated with SCGA's dominant position locally, reinforced by its widely spread network of associated directors. This influential position has undoubtedly contributed to the general policy pursued of limiting the issue of fermentary licences and the centralisation of processing in the region. This in turn has resulted in roadside buying of wet beans becoming the established system of purchase and marketing, a system which has been taken up by the new entrants into the industry such as Lus Development Corporation.

The important question is where do we go from here, as regards cooperatives and their place, if any, within the market structure. This can be considered on the basis of the SCGA's own record, as described above, and the observed changes in the external situation in which it finds itself, specifically the inroads made into its market by the increasing number of small fermentaries.

Notwithstanding the problems which have arisen, there is no denying that the SCGA was instrumental in establishing cocoa production in East Sepik. This approach therefore remains relevant for regions in similar development situations to that of East Sepik in 1973, that is, it can provide a basis in new regions where a mechanism is needed for the mobilisation of growers and rapid establishment of market infrastructure in the absence of an established network of traders.

With some 70 to 80 applications for new small fermentaries last year, substantial new inroads on SCGA's market can be anticipated every year, however. All new fermentaries sold their dry beans to Angco last year. The increase in the number of independent fermentaries may indeed have influenced Angco in establishing a permanent presence in Wewak.

This itself would call for a substantial reduction in its scale of operations had this not been indicated in any case by the observed diseconomies of large-scale operation affecting management. The scope for streamlining its activities, perhaps with a proportion of villages hiving off to form their own organisation, might be investigated, at the same time as the detailed economics of individual roadside buying runs are examined.

The Lus Development Corporation runs on small similar lines. Its main focus has been on coffee, the corporation only coming into cocoa marketing in 1986. The Corporation itself was started in 1975 with an initiative from (Sir) Pita Lus, who was instrumental in mobilising village groups. Like SCGA a membership subscription of K5-10 provided the initial capital of K100,000 collected from some 32,000 people, with which it was possible to purchase a coffee factory.

Lus operates a business group system with roadside buying. Groups collect produce from the growers and arrange a special day on which Lus will collect the cocoa. It is supported by more than 100 groups of coffee growers, and in 1988 by 134 groups in all. An advantage has been that the same groups could be used for cocoa as already established for coffee, while the availability of coffee as a high-valued crop makes an important contribution to the financial security of the system. Direct collection from the groups is limited to about 50, however, mostly along the Sepik River in Maprik.

Some large village groups have as many as 1,000 members, but more are about 300 in size and include many family business groups. The groups have their own directors with chairman, secretary/treasurer and three committee members. A collection of 10-20 groups may elect a director of Lus Development, which therefore has only 11 directors, compared with 39 for SCGA. Dividends are paid to groups.

Originally groups were being advanced crop finance for the purchase of coffee. However, very few of the 134 groups are operating as they should, many experiencing problems of financial management and specifically with particular managers. Problems developed with the increase in the number of groups in 1979 and 1980. Crop finance was stopped in 1981 and the guaranteeing of loans for vehicles in 1983.

This experience parallels that of SCGA, and raises similar questions, though Lus is of a more manageable size. In this case management problems have been apparent, on the other hand, even at the group level. It remains based on the collection and transport of wet bean, through roadside buying in part, and leaves open the question whether distributed smaller fermentaries under which the transportation of bulky wet bean is minimised are not more economic.

In East New Britain the issue is the viability of independent small marketing business groups and cooperatives operating a small fermentary rather than of large associations. A feature in some cases has been inexpert pricing. Thus one cooperative visited, till put right as part of an agreement with an exporter, had been paying growers 30 toea per kilogram over an extended period when the going rate in Rabaul and available to members selling to nearby independent fermentaries was in the area of 45 toea per kilogram. The motivation here is rapid accumulation of finance for investment : but shows ignorance of the principles of competing in price with rival firms to ensure turnover and of investing only out of profits. A further weakness has been a tendency to over-expenditure on vehicles and equipment.

The official tendency to favour business groups as opposed to cooperatives may not be justified : many of the designated business groups as already mentioned, are composed of 60 or 80 members, rather than closely-knit groups, and are closer in nature to ordinary marketing cooperatives. In a number of cases they have been able to secure crop finance from exporters on the basis of crop delivery contracts and have functioned usefully as intermediaries, paying cash to growers. In many parts of Papua New Guinea churches and missionary organisations have played a role in establishing groups and these have often been more durable. The effectiveness and durability of groups appears to be variable but it seems important to recognise that they may indeed play a positive role; that they deserve more positive extension advice and support than they appear to have received; that smaller, cohesive groups are more likely to be effective; and that they should be assessed on the basis of their own individual performance.

Table 57
Percentage of smallholder crop processed by group companies,
traders and individuals, Gazelle Peninsula

Period	Large cooperatives or group companies	Traders	Individuals
June 1968	65	30	5
June 1972	25	53	21
June 1973	39	45	16
December 1974	49	27	23
September 1975	29	16	55
July 1976	22	16	62
May 1977	19	33	48
Year 1987	20	29	51

Source: Produce Inspection figures, Department of Agriculture and Livestock, Rabaul.

Table 58
Was your (last) consignment sold individually or
as part of a group?

	East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik far west	Total No.	%
Cocoa							
Separately	33	76	83	28	32	252	82.1
Part of a group (unspecified) ¹	31	5	1	0	0	37	12.1
Sold together with that of a few other people	8	1	0	0	0	9	2.9
Sold as part of family group	0	1	1	2	5	9	2.9
Total, cocoa	72	83	85	30	37	307	100.0
Copra							
Separately	40	22	77	2	2	143	88.8
Part of a group (unspecified) ¹	10	0	4	0	0	14	8.7
Sold together with that of a few other people	3	0	0	0	0	3	1.9
Sold as part of a family group	0	0	0	1	0	1	0.1
Total, copra	53	22	81	3	2	161	100.0
Not answered							
Cocoa	2	4	14	8	21	49	-
Copra	17	26	18	32	58	151	-

Note: 1. May include consignments by individuals temporarily sharing a vehicle for delivery purposes or for whatever reason, not forming part of a formally constituted marketing group.

Table 59
Is it a good idea to form a business or family
group/cooperative?

	East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik far west	Total No.	%
Business group							
Yes	64	71	65	23	21	224	74.9
No	12	6	24	14	19	75	25.1
Cooperative							
Yes	16	40	37	8	18	119	40.0
No	47	34	40	24	26	181	60.0

Table 60
What is the difference between a business group
and a cooperative?

Answer	No.	Per cent	Per cent of those answering
Correct distinction ¹	89	37.4	46.6
Incorrect distinction	16	6.7	8.4
Unclear distinction	16	6.7	8.4
Don't know	70	29.4	36.6
Not answered	47	19.7	-
Total	238	100.0	100.0

Note: 1. The critical difference being taken as the number of associates or members involved, though the smaller number associated with a business group would be expected to permit more independent, flexible management and decision-making.

Table 61
Reasons for supporting/not supporting idea of cooperatives

Positive	No. of Responses	Negative	No. of Responses
1. Easy to organise and manage	1	1. Mismanagement	50
2. Quality of cooperative depends on members	1	2. Mismanagement/past experience	5
3. Good to work together	2	3. Failure of past experience in area	15
4. Good for long term	1	4. Instability of groups	1
5. Good means of securing higher prices	3	5. Hard to organise and manage	6
6. Can't sell copra/cocoa quickly without a cooperative	1	6. Too many people involved	40
7. Would help with respect to transport and purchase of bags	8	7. Everyone would want to be boss	3
8. Can get financial assistance from govt.	2	8. Conflict of interest	43
9. Stronger use of cooperation among Tolai	1	9. Big producers would be supporting small	1
10. Better than business group	1	10. People not prepared to cooperate/oriented towards cooperation	4
11. More people, may have good business ideas	1	11. Cooperation between clans is not good, different ethnic groups	2
		12. People prefer idea of independent effort and reward	17
		13. Grower sells to highest bidder	1
		14. Lack of honesty, stealing	3
		15. Lack of understanding between members	1
		16. Don't trust other people	2
		17. Does not trust non-family	3
		18. Lack of leadership	5
		19. People outside family clan involved	4
		20. Illiteracy problem	1
		21. Does not want to invest money	1
		22. Costs too much to join	1
		23. Prices paid are too low	2
		24. Non-payment of dividends	3
		25. Unsatisfactory prices, dividends	5
		26. Ask for contributions without giving any return	1
		27. Delay, bureaucracy in paying out	1
		28. Not profitable	3
Total	22		225

Table 62
Reasons for supporting/not supporting idea of business group

Positive		No. of Responses	Negative	No. of Responses
1. Easier to run		7	1. Hard to run	4
2. Okay on family basis		21	2. Disagreements, arguments arise	1
3. Good understanding between members in a family, common interest in a family group		3	3. Conflicts of interest occur	10
4. Will only cooperate with his family		3	4. Everyone wants to be boss	3
5. Only if doesn't involve people from other villages		1	5. Does not trust others/others lack same commitment	2
6. Good to establish at village level		1	6. Lack of trust a problem	3
7. Would help family work harder		1	7. Illiteracy	1
8. Good to work together		1	8. Laziness	1
9. Stronger sense of cooperation among non-Tolai		1	9. Lack of leadership skills	3
10. Beneficial with good management		2	10. Lack of capital	2
11. Impossible to sell quickly without group		1	11. Experience adverse	4
12. Good means of selling		4	12. Collapse quickly, instability	5
13. Want group in order to operate vehicle		1	13. Too small	1
14. Would help with transport		2	14. Without road link, slim chances of success	1
15. Need for sharing a copra drier		1	15. Pay low prices	3
			16. Ask for contributions, don't yield return	1
			17. Business group too selfish, profit-minded	1
			18. Prefer idea of independent effort & reward	16
			19. Prefer selling to any buyer	1
Total		50		63

Chapter 11

THE ECONOMICS OF ROADSIDE BUYING

One of the major points of contrast between cocoa marketing in East New Britain and in East and West Sepik is the importance of roadside buying of wet bean in the latter. It is worth commenting on this separately since it is an aspect of marketing that is commonly criticised. And it is an important element of crop marketing in Papua New Guinea as a whole. It was observed in 1982 that about 58 per cent of the total coffee crop and 73 per cent of smallholder coffee production was marketed in this way (Coffee Industry Board 1982, p. 33). While this report on the coffee industry took a comparatively benign view of the phenomenon, the more recent report on the cocoa industry itself (Cocoa Industry Investigating Committee 1987, p.9) recommended simply "no roadside buying" (recommendation 14).

As the former report states (p.37), the usual basis for criticism is that roadside buying is unregulated and contributes to deteriorating quality, in the case of coffee and more generally. Since the Cocoa Industry Investigating Committee did not find evidence of deteriorating quality its recommendation is surprising. A particular problem in Papua New Guinea is that threat of assault makes it difficult for produce to be sorted and discriminated in terms of price at the roadside. But as both reports acknowledge, official roadside inspectors might be in no better position to enforce discriminating purchases. This does possibly constitute an advantage of purchase at fixed points such as central or local fermentaries : this begs the question, however, of the transportation of wet bean to these points, and its costs.

It is more useful to consider two different potential effects : (a) the effect on competition in marketing and (b) the net effect on transportation costs. The former effect should be positive here as in the case of coffee, where the Coffee Report states (Coffee Industry Board 1982, p.35) that "in the main growing areas, buyers should be kept honest by the intense level of competition, with sellers having the opportunity to sell to ten or more buyers during the course of a day". In East Sepik the number of buyers is less but their multiplicity is already appreciated by growers, who also do not face the same risk of being unable to dispose of their produce.

Compared with individual growers carrying their own produce to export points such as Wewak, roadside buying will also reduce transport costs by allowing some degree of bulking and fuller capacity utilisation of vehicles. While the basis of pricing in East and West Sepik does not appear entirely rational, as we have seen, growers in villages served by roadside buyers appear to have enjoyed significantly higher net prices for their produce than others (Table 25). It is clearly the greater distances between grower and export point in East and West Sepik compared with East New Britain which have fostered the development of roadside buying.

Compared, on the other hand, with a marketing and processing system based on distributed small fermentaries, roadside buying involves the movement of bulky wet bean over long distances. Thus transport costs may fall as the latter system is developed and a greater proportion of the crop is transported as dry bean : it would not make sense, however, to prohibit or restrict the practice of roadside buying in advance of such development.

Chapter 12

DEVELOPMENT POLICY FOR NEW COCOA PRODUCTION

As noted at the outset, only a small proportion of land with potential for cocoa is currently under production and in many of the potential regions production is still embryonic. There exists here a "vicious circle" in that the growth of production is handicapped by lack of roads and marketing organisation while in turn low volume of output makes development of these less economic. Despite this, if a substantial spurt in production can be achieved, improvements in processing and marketing organisation can be expected to follow over time. It is worth giving some consideration to what an appropriate development policy would be.

Different approaches are being pursued simultaneously in different parts of Papua New Guinea in fact. The first is that of cocoa blocks, based on resettlement. An example is the Pes Land Development Scheme around Poro in West Sepik. Although this was initiated in the mid-1970s by 1988 only 199 blocks had been developed of which 65 only were occupied by settlers. Of these 12 were in good condition (6 per cent of the original 199), 22 were relatively new and 31 had been previously developed but were not now in good condition. Three weaknesses may be identified, falling into the three categories which are common to so many settlement schemes throughout the world. There had been poor technical planning, so that in 1988 many wanted to leave their plots, complaining of flooding, poor soils, pests and diseases. There appeared to have been little monitoring and evaluation of the scheme, the last survey having been made in 1982, despite the multiplication of these problems. Thirdly, the plots allocated were too large, at 8 to 15 hectares (equivalent to 1,500 - 4,000 trees). This is not only inequitable but created problems of lack of finance for hiring labour and difficulties in bringing in labour from the settlers' home area. In fact an area of two hectares or less of hybrid cocoa (some 500 trees or so) will exhaust the labour of an average family*. A survey in May 1985, of local villages standing outside the scheme showed that 83 out of 150 (55 per cent) of households owned less than 300 trees, with only 12 per cent owning more than 600.

A second approach is that of the Angco-Dev individual blocks. Angco-Dev is a development wing of the leading exporter, which is attempting in collaboration with the Agriculture Bank to promote efficient small-scale production. The typical smallholder is not the target producer: participants must pay agency fees to Angco-Dev of K6,000 for a 20-hectare block. Very strict requirements are imposed on applicants, who must have a block with executed survey, registered or pending titles and equipped with access roads. Angco-Dev itself plants the trees, which makes it easier for those who have the wealth in the form of land or capital to develop the block using hired labour: one might say the scheme is directed towards owners rather than "doers", existing smallholders. This is perhaps the least appropriate scheme if the objective is to achieve wide development of cocoa. The bureaucratic requirements are certain to mean rather slow expansion of area; the size of individual block aimed at is bound to add to existing inequity, apart from advantages gained in access to finance; and the top-down approach to farm planning and development appears paternalistic, seeking to satisfy technical rather than economic maxima. Such schemes are likely to have very narrow participation and make only a minimum quantitative difference to the aggregate annual rate of increase in cocoa area.

The third, more appropriate approach is typified by the Smallholder Cocoa and Coconut Rehabilitation and Expansion Project (SCREPP) established in East New Britain. This developed out of the National Public Expenditure Programme, started in

* Industry sources say that these official figures imply low planting density and labour productivity. Editor

1978. By the end of 1987 it embraced some 5,000 to 6,000 farmers with an average of 0.5 hectares : farmers are not eligible for a second half-hectare so long as other villagers are queuing for assistance. In comparison the target sizes of cocoa block in the previous schemes described are 30 to 40 times as great. There is also substantial involvement by the development agency, in this case the Department of Agriculture and Livestock (DAL), but here with much closer participation of the farmer. Clear felling of land is carried out jointly by smallholders and DAL teams using axes and chainsaws. Subsequently, the block is marked out by the department and shade trees designed and planted by the department, but farmers plant the cocoa trees themselves. An important element is that planting materials are supplied by DAL nurseries while, more paternalistically perhaps, fertilisers and chemicals are supplied free by the department for the life of the project. Central nurseries now exist throughout East New Britain. Some village groups have developed their own nurseries for sale, trained by DAL, and have made substantial profits, though it is reported that they tend to break up once DAL withdraws from close participation. The department has established 20 to 30 such groups, and others have been initiated through community government intervention.

In selecting or designing a development programme in a new area it is important to appreciate the existing situation from which we are working. In Aitape District - the most important cocoa-growing district in West Sepik Province - 15 per cent of households in a sample owned 65 per cent of the cocoa trees, while the least well-endowed 42 per cent of households owned just 6-1/2 per cent of the trees (Table 63), indicating a high degree of stratification. In relation to the target areas being used in settlement schemes it may be noted that about two-thirds of growers in the sample in West Sepik as a whole owned less than 300 trees, the modal holding having just 166 trees.

The same point may be made with respect to coconut production. Because coconuts have long been established in Papua New Guinea, and because they serve as a subsistence food crop also, one would expect to find a much more equitable distribution of these trees. In the same sample, however, 4 per cent of households were found to own 69 per cent of the trees (Table 64). The figure of 4 per cent is misleading, however, since some of the areas are unsuitable for coconut production, and here all households will have a zero holding. But even when these are excluded, 17 per cent of households own 69 per cent of the trees owned. Thus stratification of ownership is just as great in respect of coconuts as with cocoa.

This data is still somewhat misleading since some households may also or instead own coffee trees. Accordingly an index of ownership of all three tree types was calculated (Table 65), giving coconut trees a one-third weight compared with the other two. This showed 10 per cent of households owning 48 per cent of the trees, and the poorest 52 per cent of households owning 12-1/2 per cent of trees. The high degree of rural stratification thus appears genuine. It is likely that a similar situation exists in East Sepik and other tree-crop areas.

Taking this into account, and the evidence of the cocoa promotion programmes reviewed, it is evident that a conscious effort must be made to develop on a broader front, using a frontal rather than narrow approach to expanding cocoa production. Nurseries are clearly essential to such a frontal approach aimed at maximum participation by growers and should constitute a key component.

As observed earlier, though smallholder cocoa production in Papua New Guinea appears to have expanded at a very satisfactory rate, this expansion has been highly concentrated in a few regions. Expansion in East Sepik has been comparatively

encouraging. It would probably not be accurate to say, however, that this was the result of a well-conceived agricultural development programme. The restrictive policy pursued towards licensing of new fermentaries has probably acted as a brake on expansion and the agricultural extension effort in the area remains weak and office-based. A major influence on expansion, especially in the initial phase of cocoa development, has been Sepik Cocoa Growers and what is significant here is the way in which mass mobilisation of villagers was achieved through the medium of village and clan groups. This suggests that a frontal approach to cocoa development should be based on group extension using village units and should be directed towards all village members including, and perhaps especially, those without many trees. This is an opposite policy to that being pursued at the moment by DAL in Vanimo for West Sepik, which is using a 2-hectare minimum guideline for recommended involvement in cocoa production. This is unrealistic as well as undesirable, given that it would exclude about 80 per cent of present households (Table 63).

Table 63
Percentage size distribution of ownership
of cocoa trees, West Sepik

No. of trees	Aitape		Lumi		Nuku		Vanimo		Total	
	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %
0	-	-	9.7	-	23.4	-	6.1	-	11.4	-
1-19	-	-	1.4	-	3.6	0.1	15.2	1.1	3.3	0.1
20 -	11.1	0.5	6.9	1.1	7.2	1.0	18.2	4.2	9.5	0.9
	42.2	6.6						66.3	15.1	
50 -	12.2	1.1	12.5	3.8	14.4	3.3	12.1	5.6	13.1	2.2
100 -	15.6	2.6	18.1	9.4	21.6	10.2	24.2	21.0	19.3	6.2
200 -	7.8	2.3	16.7	15.4	8.1	7.0	6.1	9.3	9.8	5.7
300 -	18.9	8.2	20.8	29.8	5.4	7.5	9.1	20.2	13.4	11.8
500 -	8.9	6.5	8.3	17.8	4.5	9.0	9.1	38.5	7.2	10.0
700 -	4.4	4.2	2.8	7.6	6.3	19.3	-	-	4.2	8.3
1000 -	6.7	8.9	-	-	0.1	3.2	-	-	2.3	5.8
1250 -	-	-	1.4	6.9	0.2	8.4	-	-	1.0	3.1
1500 -	7.8	16.3	1.4	8.2	0.1	6.3	-	-	2.9	12.0
2000 -	2.2	7.3	-	-	-	-	-	-	0.7	4.1
3000 -	-	-	-	-	0.1	11.9	-	-	0.3	2.9
4000 -	-	-	-	-	0.1	12.8	-	-	0.3	3.2
	15.6	65.6						6.5	49.0	
5000 -	1.1	7.3	-	-	-	-	-	-	0.3	4.1
6000 -	1.1	10.6	-	-	-	-	-	-	0.3	6.0
									1.3	
8000 and over	2.2	24.0	-	-	-	-	-	-	0.7	13.6
No. in sample	90	72,528	72	19,403	111	31,689	33	4,912	306	128,532
Mode (No. of trees)	-	335	-	208	-	108	-	100	-	166

Source: West Sepik Development Project, 1987 survey.

Table 64
Percentage size distribution of ownership of
coconut trees, West Sepik

No. of trees	Aitape		Lumi		Nuku		Vanimo		Total	
	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %
0	25.5	-	100	-	98.2	-	90.0	-	76.5	-
1 -	3.3	..	-	-	-	-	-	-	1.0	..
20 -	6.7	0.5	-	-	0.1	9.8	-	-	2.3	0.6
50 -	10.0	1.8	-	-	-	-	3.0	17.1	3.3	2.0
100 -	16.7	6.2	-	-	-	-	3.0	30.9	5.2	6.5
200 -	8.9	5.2	-	-	0.1	90.2	3.0	52.0	3.3	6.3
300 -	10.0	9.0	-	-	-	-	-	-	2.9	8.9
500 -	5.6	7.2	-	-	-	-	-	-	1.6	7.1
700 -	13.3	2.2	4.6	-	-	-	-	-	0.7	4.5
1000 -		2.2	5.7	-	-	-	-	-	0.7	5.6
1250 -		2.2	7.2	-	-	-	-	-	0.7	7.1
1500 -		1.1	4.1	-	-	-	-	-	0.3	4.0
2000 -		3.3	18.2	-	-	-	-	-	1.0	17.9
3000 -		-	-	-	-	-	-	-	-	-
4000 -	13.3	1.1	11.3	-	-	-	-	-	0.3	11.1
5000 -		-	-	-	-	-	-	-	-	-
6000 -		1.1	19.0	-	-	-	-	-	0.3	18.6
8000 and over		-	-	-	-	-	-	-	-	-
No. in sample	90	36,921	72	-	111	246	33	450	306	37,617
Mode (No. of trees)	-	127	-	-	-	-	-	-	-	-

Source: West Sepik Development Project, 1987 Survey.

Table 65
Index of ownership of cocoa, coconut and coffee trees¹,
West Sepik

No. of trees	Aitape		Lumi		Nuku		Vanimo		Total	
	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %	No. of hh %	trees %
0	-	-	-	-	1.8	-	3.0	-	1.0	-
1 - 19	-	-	-	-	-	-	15.2	1.0	1.6	..
20 -	4.4	0.2	4.2	0.4	4.5	0.4	18.2	4.0	5.9	0.4
50 -	8.9	0.6	11.1	1.9	8.1	1.3	12.1	5.3	9.5	1.2
100 -	17.8	2.5	8.3	2.7	25.2	7.4	21.2	16.5	18.6	4.4
200	10.0	2.5	16.7	8.8	20.7	11.0	12.1	17.6	15.7	6.6
300 -	11.1	4.4	27.8	21.6	16.2	12.7	9.1	19.7	16.7	10.5
500 -	6.7	4.0	12.5	15.8	7.2	8.8	9.1	35.9	8.5	8.3
700 -	15.6	13.0	5.6	9.7	3.6	6.6	-	-	7.2	10.3
1000 -	7.8	8.8	6.9	16.2	4.5	10.6	-	-	5.6	10.6
1250 -	2.2	3.1	2.8	8.2	3.6	9.7	-	-	2.6	5.9
1500 -	5.6	9.7	4.2	14.7	0.9	2.9	-	-	2.9	8.5
2000 -	4.4	10.5	-	-	0.9	4.1	-	-	1.6	6.5
3000 -	1.1	3.6	-	-	0.9	6.5	-	-	0.7	3.7
4000 -	-	-	-	-	1.8	17.0	-	-	0.7	5.0
5000 -	1.1	5.8	-	-	-	-	-	-	0.3	2.9
6000 -	-	-	-	-	-	-	-	-	-	-
8000 -	2.2	19.4	-	-	-	-	-	-	0.7	9.8
10,000 -	-	-	-	-	-	-	-	-	-	-
11,999	1.1	11.9	-	-	-	-	-	-	0.3	6.0
No. in sample	90	91,504	72	34,074	111	53,361	33	5,272	306	182,761

Note: 1. Cocoa and coffee trees given equal weight, coconut trees given one-third weight.

Source: West Sepik Development Project, 1987 Survey.

Chapter 13

GOVERNMENT SUPPORT PURCHASING OF COCOA AND COPRA

In many parts of Papua New Guinea, including areas within West Sepik, particularly those inland, private sector marketing channels have hardly been available to growers for the disposal of their produce, and DAL has been obliged to step in to establish a small fermentary or buying point for cocoa and/or copra, to be run by local DAL officers. DAL at Konedobu (Port Moresby) issues recommended prices every month to serve as guidelines for price determination. The prices apply to provincial capitals and local officers are asked to deduct freight from the provincial capital to each buying centre before determining prices to be paid to the grower. More recently an additional deduction of 10 toea per kilogram for roadside purchase (purchase on patrol) has been recommended. In previous years a 5 toea per kilogram deduction from the purchasing centre price (10 toea for dry bean) was recommended for purchases in the field.

Although prices are indicated for each capital, many of these are not relevant, since government purchasing is not necessary. The main areas in which cocoa is purchased are Manus (Lorengau), Milne Bay (Alotau) and Oro (Popondetta) (Table 66), though buying points have been established in additional places, in West Sepik for instance, in the last year or so. Government purchases of copra have been concentrated in Gulf Province (Kerema), Milne Bay (Alotau) and Oro (Popondetta).

It is worth comparing recommended prices with main dealer prices at Rabaul, which may be taken to represent most closely the market price at provincial capital level for major ports (Table 67). Over the period from 1984 onwards it may be seen that the recommended prices were in excess of market prices, even allowing a 2 toea price difference between major and minor ports, by variable amounts of the order of 15 toea per kilogram. A downward gearing of recommended prices in August 1987 reduced the discrepancy substantially, though prices were not finally brought into line until January 1988. The actual prices paid at buying points were equally out of line with the market over most of the period. These prices therefore represent a substantial subsidy to growers in those areas where actual purchases have been made.

A factor appears to have been that a major error in the formula determining the recommended price affected cocoa pricing for the entire period up to August 1987: no allowance had been made to cover the processing margin. When this was incorporated in August 1987 through a 15 per cent deduction, this brought a sharp downward shift in the price series.

A different matter is whether prices are consistent across provinces. As recommended, the prices do appear consistent, identical prices at the main ports, Rabaul, Lae, Madang, Kimbe and Kieta being taken as the benchmark, with a 2-toea deduction made for most other capitals and a 3-toea deduction for Daru. The important question is whether appropriate deductions have been made by local officers to allow for transport costs between buying point and point of shipment and for higher costs per kilogram for processing and transport resulting from small quantities. These allowances do not appear to have been consistently made, again resulting in unrealistic prices, and where they have been made, applied unevenly, giving a significantly higher grower price inland at Poro, for example, than at Pasi, on the coast (Table 67).

Discrepancies over time and between regions, however, have arisen particularly because of differences in the extent to which recommended prices have been

followed. Thus until August 1987, Alotau, Bereina and Kerema followed the (high) recommended prices closely while Lorengau, Boroko and, in 1987, West Sepik buying points followed independent, all lower but all different pricing policies. Over both time and space, therefore, divergencies from the recommended prices have been variable (Table 68).

The above is unsatisfactory (a) in imparting incorrect price signals to growers, over time and compared with other crops; (b) in offering different levels of subsidy between regions; and (c) by distributing subsidies through price which benefits all growers equally irrespective of need.

What is required, first of all, is closer communication between the DAL Marketing Section at Konedobu and local officers in the field to determine realistic processing, transport and handling costs from buying point to point of shipment, together with a reporting system, not at present in place, under which actual prices charged at buying points are reported back to headquarters. Communication is required also regarding current private sector prices being paid nationally and locally, these to be taken into account in determining prices.

Government policy of intervening in the market where private purchasers are not available locally, while anticipating an eventual hand-over to private purchasing, is sensible. An element of subsidy may be inevitable where local production is still embryonic and unit costs of marketing high for this reason: but such direct price subsidy should be minimised. Finance should be directed instead towards the subsidisation of extension services, government nurseries and the distribution of seedlings at nominal prices, which will benefit those who do not have the largest number of trees already and will mean that subsidies are targeted directly towards increasing the number of trees in the area. As already stated, public funds should be directed away from privileged, high-cost settlement schemes and large private cocoa blocks.

Much of the above comment on DAL pricing applies to copra as well. Prices are affected here by the Copra Board policy of charging uniform prices at all depots, ignoring transport costs between minor and major ports. Taking these as given, however, more account needs to be taken of actual costs of transport between buying point and the depot of immediate destination, and more information on these obtained and fed into the system of price determination.

Table 66
DAL provincial purchases of cocoa and copra, 1985 (kgs)

Province	Cocoa, wet bean		Copra	
	kg.	Per cent	kg.	Per cent
Gulf (Kerema)	11,600	8.5	112,000	36.6
Central (Boroko)	10,700	7.8	-	-
Milne Bay (Alotau)	34,301	25.1	68,258	22.3
Oro (Popondetta)	34,301	25.1	68,259	22.3
Morobe (Lae)	-	-	41,000	13.4
Sandaun (West Sepik)	951	0.7	6,970	2.3
Manus (Lorengau)	45,070	32.9	-	-
Total	136,923	100.0	305,720	100.0

Source: Department of Agriculture and Livestock.

Table 67
Recommended and actual wet bean prices paid at D.A.L.-operated fermentaries/buying points, 1984-1988

Year/ Month	Rabaul main dealer price A	Lorengau (Manus) R A	Alotau (Milne Bay) R A	Boroko (Central) R A	Bereina (Central) R A	Kerema (Gulf) R A	Poro roadside (W. Sepik) R A	Nukvango (W. Sepik) R A	Lumi (W. Sepik) R A	Pasi (W. Sepik, Vanimo) R A
1984	J	46.4	-	54	-	-	-	-	-	-
	F	49.1	-	43	-	-	-	-	-	-
	M	47.0	55	44	-	-	-	-	-	-
	A	44.3	-	48	-	-	-	-	-	-
	M	46.0	-	53	-	-	-	-	-	-
	J	46.0	57	53	-	-	-	-	-	-
	J	45.2	51	57	-	-	-	-	-	-
	A	46.4	50	51	-	-	-	-	-	-
	S	49.5	-	51	-	-	-	-	-	-
	O	49.4	53	53	-	-	-	-	-	-
	N	47.1	-	53	-	-	-	-	-	-
	D	46.0	-	53	-	-	-	-	-	-
1985	J	47.2	42	46	-	-	-	-	-	-
	F	49.0	46	46	-	-	-	-	-	-
	M	50.2	46	63	-	-	-	-	-	-
	A	50.2	46	63	-	-	-	-	-	-
	M	50.0	46	63	-	-	-	-	-	-
	J	48.0	46	64	-	-	-	-	-	-
	J	47.7	-	50	20	-	-	-	-	-
	A	48.3	-	50	-	-	-	-	-	-
	S	49.0	-	47	-	-	-	-	-	-
	O	49.0	-	50	-	-	-	-	-	-
	N	49.0	64	63	60	-	-	-	-	-
	D	50.5	-	47	70	-	-	-	-	-

Table 67 (continued)

		Rabaul main dealer price		Lorengau (Manus)		Alotau (Milne Bay)		Boroko (Central)		Bereina (Central)		Kerema (Gulf)		Pororo roadside (W. Sepik)		Nukvango (W. Sepik)		Lumi (W. Sepik)		Pasi (W. Sepik, Vanimo)	
		A		R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
1986	J	51.0		68		68	68	71	71	71	66	67	67	-	-	-	-	-	-	-	
	F	50.7		67	-	67	67	70	40	45	66	66	-	-	-	-	-	-	-	-	
	M	48.7		64	60	64	67	67	62	67	63	63	-	-	-	-	-	-	-	-	
	A	45.6		62	60	62	58	61	56	61	61	58	58	-	-	-	-	-	-	-	
	M	45.0		59	50	59	58	58	48	58	55	55	-	-	-	-	-	-	-	-	
	J	44.2		56	50	56	56	56	46	56	56	52	52	-	-	-	-	-	-	-	
	J	46.0		57	60	57	57	56	46	56	56	53	53	-	-	-	-	-	-	-	
	A	46.6		59	-	58	50	58	48	48	55	55	-	-	-	-	-	-	-	-	
	S	47.0		62	60	62	62	62	52	62	62	61	61	-	-	-	-	-	-	-	-
	O	47.0		64	50	64	62	64	54	64	64	63	63	-	-	-	-	-	-	-	-
1987	N	47.9		62	50	62	62	62	54	62	52	61	61	-	-	-	-	-	-	-	-
	D	47.0		61	50	61	61	61	61	61	60	60	-	-	-	-	-	-	-	-	-
	J	47.0		60	50	60	60	60	51	60	61	59	60	60	-	60	45	60	40	40	40
	F	47.0		50	50	60	60	60	50	60	60	59	59	60	50	60	45	60	40	40	40
	M	47.0		59	50	59	59	59	49	59	59	58	58	59	50	59	45	59	40	40	40
	A	47.6		59	50	59	59	59	49	59	59	57	57	59	50	59	45	59	40	40	40
	M	47.3		59	50	60	60	59	59	60	58	58	58	59	50	59	45	59	40	40	40
	J	46.2		59	50	60	60	59	58	59	59	58	58	59	50	59	45	59	40	40	40
	J	46.0		59	50	59	59	59	49	59	59	58	58	59	50	59	45	59	40	40	40
	A	46.0		51	50	51	57	51	57	51	44	50	56	51	50	51	45	51	40	40	40
1988	S	46.0		53	60	53	55	53	53	53	43	52	52	53	50	53	45	53	40	40	40
	O	45.4		49	60	49	55	49	49	49	39	48	48	49	50	49	40	49	40	40	40
	N	46.0		48	50	49	49	48	44	48	38	48	48	48	50	48	45	48	40	40	40
	D	46.2		49	50	49	49	48	48	48	38	48	48	49	50	49	45	49	40	40	40
	J	-		44	50	45	-	44	44	44	34	44	44	44	50	44	45	44	40	40	40
	F	-		45	50	46	-	45	45	-	35	45	43	-	50	-	45	-	40	40	40
	M	-		43	50	44	-	43	43	-	33	43	43	-	40	-	45	-	40	40	40

Table 68
Discrepancies of actual below recommended wet bean prices paid at D.A.L.-operated ferrienteries/buying points, 1986-1988

	Lorengau (Manus)	Alotau (Milne Bay)	Boroko (Central)	Bereina (Central)	Kerema (Gulf)	Poro roadside (W. Sepik)	Nukvango (W. Sepik)	Lumi (W. Sepik)	Pasi (W. Sepik, Vanimo)
Differences (toea per hilogram)									
1986	J	-	0	5	0	-	-	-	-
	F	-	0	25	0	-	-	-	-
	M	4	-3	5	0	-	-	-	-
	A	2	4	5	0	-	-	-	-
	M	9	1	10	0	-	-	-	-
	J	6	0	10	0	-	-	-	-
	J	7	0	10	0	-	-	-	-
	A	-	8	10	0	-	-	-	-
	S	2	0	10	0	-	-	-	-
	O	14	2	10	0	-	-	-	-
	N	12	0	8	0	-	-	-	-
	D	11	0	0	0	-	-	-	-
1987	J	10	0	9	-1	-	-	-	-
	F	0	0	10	0	10	15	15	20
	M	9	0	10	0	9	14	15	20
	A	9	0	10	0	9	14	14	19
	M	9	0	0	0	9	14	14	19
	J	9	0	1	-1	9	14	14	19
	J	9	0	10	0	9	14	14	19
	A	1	0	6	0	1	6	6	11
	S	-7	-6	-6	-6	3	8	8	3
	O	-11	-2	0	0	-1	4	9	9
	N	-2	0	4	0	-2	3	8	8
	D	-1	0	0	0	-1	4	9	9
1988	J	-6	-	0	0	-6	-1	4	4
	F	-5	-	0	2	-	-	4	5
	M	-7	-	0	0	-	-	-	3

Source: Derived from Table 67.

Chapter 14

VILLAGE PROCESSING OF COPRA

The processing of copra is a comparatively simple drying procedure, compared with that for cocoa wet beans, one which can be carried out at village level. Quite a large proportion of villagers have their own copra driers, 19 out of 83 owners of copra driers in our survey (Table 69) maintaining the facility for their personal use and another 21 using it in this way and also allowing free use to close relatives and sometimes others in the village.

While there is a certain amount of uncharged use of copra driers, if we examine villagers' responses in the same table, the large majority had to pay for processing, whether to individual owners or for use of village-owned, business group-owned or mission-owned facilities. This suggests that those owners who allowed free use of their drying facilities did so for limited numbers of villagers, presumably close relatives. In many cases even sons or fathers were charged for access to a drier. Thus both processing and transportation of the product should be viewed as items which have to be paid for on a commercial basis, for the most part, and not something which can be arranged on a friendly basis or through the extended family.

Our survey investigated the prevalent rates charged for the use of drying facilities (Table 70). The basis is usually per drier load or per fire, and the fee either K5 or K10. However, fees vary rather widely and may differ considerably between owners within the same village. In some cases the rate charged is adjusted if the price of copra goes high or low.

Assuming drier capacity of five or six bags as typical, and a final sale price for the grower of K14 a bag, a charge of K10 per load is equivalent to 12-14 per cent. This deduction is additional to the substantial charge for transportation which, as seen previously, may reduce the net price to the grower well below K14 or whatever is the current final sale price.

These charges, however, only constitute part of the processing cost. Substantial additional costs are incurred in the form of labour costs (Table 71), these being incurred particularly in collecting firewood. In most cases firewood must be provided by the user of the drier and involves hiring others for assistance in collection, in a number of cases women, often paid for in kind by providing food. Because of the distances over which firewood may need to be brought there are often substantial transportation costs also. These additional costs were not evaluated, and will depend on specific local circumstances, but could well bring total processing costs to over 20 per cent of final sale price. Hence, certainly, the efficiency and effectiveness of village processing of copra is a matter meriting attention.

Both owners of driers and other villagers were asked to state the main problems they faced in processing copra. These may be roughly categorised (Table 71) as comprising particularly labour costs; difficulties in securing firewood; transport costs; and the poor condition of many driers or of the construction in which they are housed, these often being made of bush materials. In some cases villagers find the amount of locally available capacity inadequate. There is need for a modest programme of assistance to expand or upgrade processing facilities either by helping individuals or by helping to establish village or group-owned units, only, however, where a particular village situation calls for this.

The broad position of processing for copra remains very much in contrast with that for cocoa. While there are many areas in Papua New Guinea where good potential exists for growing cocoa, such production is constrained by a vicious circle, development of production being impeded by absence of processing facilities and the establishment of processing facilities being impeded by the low level of production. The very simple, small-scale nature of copra drying technology means that this particular indivisibility does not apply in the case of copra.

Mention may be made of another study of copra drying in Papua New Guinea, relating to Karkar Island, off Madang (Landell-Mills 1986). In a sample of 70 farmers no farmers sun-dried their copra, 37 per cent owned their own "ceylon-type" driers and another 13 per cent owned other permanent driers, 50 per cent altogether, while the other 50 per cent rented from neighbours. No mention is made of free use of neighbours' driers. This confirms the relatively high proportion of farmers owning driers (higher than in our survey) and the generally commercial basis of access even to village processing (again higher than in our survey, if accurate).

Table 69
Extent of fee-charging by copra drier owners and of fee payment by villagers

	No. in sample	No. of owners	Owners charging fee	Owners not stating if charging fee	Owners with drier reserved for personal use	Owners not charging fee	Other vill-agers in sample	Vill-agers paying fees to private owners	Villagers paying use of group/communal drier	Villagers with free use of others' driers	Villagers with free use of group/communal driers	Villagers not stating if pay or not for use of others' driers	No. of vill-agers sun-drying
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Vunadidir	12	3	2	-	1	-	9	8	1	-	-	-	-
Malabunga	10	3	1	-	2	-	7	6	1	-	-	-	-
Gaulim	10	3	1	-	2	-	7	6	1	-	-	-	-
Taulil	14	8	2	-	6	-	6	6	-	-	-	-	-
Vunga	8	1	-	1	-	-	7	7	-	-	-	-	-
Karawop, etc.	9	5	3	-	2	-	4	3	-	-	-	-	-
Bolken	12	5	3	-	1	1	7	1	3	-	3	1	-
Lowan	21	8	4	-	1	3	13	11	2	-	-	-	-
Balam	7	6	4	1	-	1	1	1	-	-	-	-	-
Kauk	8	4	4	-	-	-	4	3	-	-	-	1	-
Sowan	6	2	1	-	1	-	4	-	-	-	-	-	-
Swain	31	10	6	-	-	4	21	8	2	10	1	-	-
Paup	15	5	4	-	1	-	10	2	4	-	-	-	4
Siunte	10	2	-	-	1	1	8	-	3	1	-	3	1
Tumleo	10	4	1	1	-	2	6	4	-	2	-	-	-
Mallol	13	11	1	-	1	9	2	-	-	-	-	1	1
Poro	1	-	-	-	-	-	1	-	-	-	-	-	1
Romei	1	1	-	1	-	-	-	-	-	-	-	-	-
Warapu	-	-	-	-	-	-	-	-	-	-	-	-	-
Sissano	2	2	2	-	-	-	-	-	-	-	-	-	-
Waramo	-	-	-	-	-	-	-	-	-	-	-	-	-
Ossima	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	200	83	39	4	19	21	117	66	21	13	4	6	7

Table 70
Prevalent charges made for village drying of copra

Village	Prevalent copra charges	Other common charges	Other charges cited
Vunadidir	K5/load, K1/bag	-	K2/bag, K10 any quantity, K5 any quantity, K5/vehicle load.
Malabunga	K1/bag	K5/load	K5/vehicle load, K5 any quantity, K10 any quantity, K2/bag, K5-10/drier load.
Gaulim	K10/vehicle load, K5 smaller amounts	-	K2/bag, K5 load, K2.50/load, K10 any quantity.
Taulil	K5/load	-	K5-10/load dep. on owner, K10 any quantity, K1/bag.
Vunga	K2-5/load acc. to amount	-	K4/load, K5-10/vehicle load.
Karawop	K10/load	K3/load	K2/bag
Boiken	K10/load	K5/load	K2/load, K1/bag.
Lowan	K10/load	K5/load	K2/bag, K20/load.
Balam	K5/load, K3/load	-	K2/load, varying with price of copra.
Kauk	K10/load		K10 any quantity, K5/load, K3 any quantity.
Sowan	K10/load	-	K7/load.
Swain	K5/load	-	K6/load.
Paup	K5/load	K10/load	K2/load.
Siunte	Free use	-	-
Tumleo	K5/load	Free use	-
Mallol	Free use	-	K2/load
Sissano	-	-	K10/load, K2 load.

Table 71
Problems faced by villagers in processing their copra

	East New Britain owners/others	East Sepik owners/others	West Sepik owners/others	drier owners	Total other villagers	all villagers
Labour costs, cash or kind (food payment)	1/6	7/13	5/1	13	20	33
Shortage of labour for operation of drier	1/5	1/3		2	8	10
Difficulties in securing firewood	2/8	3/3	4/4	9	15	24
Availability of dry firewood in wet season		1/2	2/-	3	2	5
Transport costs in bringing firewood to drier	5/14	4/8	4/5	13	27	40
Transport costs in collecting copra	-/7	4/4	2/8	6	19	25
Transport costs for selling copra		4/-		4	-	4
Transport costs, not specified		2/-	1/-	3	-	3
Low return in drying relative to costs	1/2	3/6		4	8	12
Poor condition of drier & drying house, exposure to rain, cost of needed repairs, repairs, use of bush materials	9/3	6/2	12/16	27	21	48
Desire to buy own/new drier	-/5	-/5	-/1	-	11	11
Inadequate capacity, availability of local drying facilities	-/2	-/7	-/7	-	16	16
High level of charges for drying	-/7	-/5	-/1	-	13	13
High cost of bags & twine, difficulties in purchasing bags		5/-		5	-	5
Other		2/2	-/1	2	3	5
No problems	2/-	3/4	3/3	8	7	15
Not answered	1/22	2/22	5/127	8	171	179

Chapter 15

PARALLEL ISSUES IN COPRA MARKETING

Much of our discussion has dwelt on cocoa rather than copra. The reason is that by comparison with cocoa the marketing and processing of copra in Papua New Guinea is a simple affair. Copra drying can be carried out on a small-scale at village level and does not involve the sale of produce to intermediaries. Transport, similarly, can be hired, the grower hiring a whole pick-up if he has a sufficient quantity to warrant this, or travelling by PMV with one or two sacks. Thus copra for the most part passes directly from the grower to the export point (the Copra Marketing Board (CMB) depot) without transfer of ownership or involvement of intermediaries. We have analysed the difficulties involved in processing (existent, but not major) and in transporting the crop (involving heavy costs and reductions in the net grower price). This implies a lack of bulk-building in the system, which will be more serious the longer the distance involved.

It should be said that the possibilities for bulk-building are not as great in respect of copra as with cocoa wet beans, because of the greater average bulk of consignments. Nevertheless they exist, if our transport cost calculations are correct, and it is surprising that middlemen have not emerged in this direction. One form of bulk-building which makes for fuller capacity utilisation of large vehicles is roadside buying, which we have seen is important in relation to coffee as well as cocoa. Currently the absence of roadside buying of copra may be explained by the low price of copra, affecting profitability, but roadside buying does not appear to have been a feature in the past either, when prices were higher. Another factor may be the absence of crop finance which plays some role at least in the purchase of cocoa by fermentaries but which is not extended by the CMB to any traders, buying agents or transporters who might have brought in the crop. One transporter did explain his non-purchase of copra by the fact that cocoa uses all the money, i.e. the available finance.

The market structure issue does not arise in relation to copra, since export is entirely controlled by the CMB and those traders in the two areas studied who handled at all substantial quantities of copra accounted for only a few percentage points out of total deliveries to Board depots. In early 1988, with the CMB purchase price at K207 per tonne (smoke grade), dealers in East New Britain were unanimous in regarding involvement with copra as "break-even" or loss-making activity carried on as a favour to growers. A major dealer who viewed it as loss-making stated that transport charges could not be raised if growers were to be left with any incentive at all. Lus Development Corporation in East Sepik stated that, because the copra price was so unattractive only two of their associated groups were involved. There is no question of monopoly profits therefore. Rather, a critical consideration is the balance between transport cost and copra price, determining the rate of return and degree of interest in handling copra. Changes in organisation which could operate to reduce transport costs, for instance bulk collection of copra in the villages by the CMB directly or through agents, or more effective bulk-building through village groups hiring their own transport, are worth exploring.

The monopoly issue could arise at the export level where all copra is exported via the CMB. In some countries marketing boards which have been statutory monopolies have become inefficient, but able to pass on rising costs to the grower, absorbing an increasing proportion of the export price in a widening marketing board margin. In the case of the CMB this does not appear to have happened over the decade 1976-1987, unit selling and administration costs in kina per tonne being if anything lower at the end of the period than in the earlier years (Table 72).

In the cocoa industry the quality issue has attracted a great deal of attention over the years and influenced policy in an important way. In the case of copra the CMB is able, given its position as sole exporter, to determine prices paid for the different grades, and currently pays a premium of K5 per tonne for hot air grade over smoke grade, and K2 per tonne for fair merchantable standard (FMS) over smoke.

The case for these premia is not particularly strong. Board officials themselves acknowledge there is no serious problem of quality; nor has there been any trend towards poorer quality. Villagers selling smaller quantities of copra generally produce a better quality than plantations who do not always show the same care. This is confirmed by the relative quantities rejected by Coconut Products Limited (CPL) in Toboi, East New Britain, a major purchaser. Sun-dried copra, though this accounts for only a small proportion of village sales, is considered perfect for export, suggesting that the more widely used village technology is not disadvantageous to the grower in comparison. Copra may be stored in the village for up to two months without an effect on quality, though if it is undercured some mould may develop, affecting only its oil content. Beyond two months there may be a problem of insect infestation but this merely necessitates reconditioning for resale, involving a certain extra cost. The aspects which are important to quality are freedom from fatty acid and from aflatoxin. This appears unrelated to the nature of the three grades in question. The smoke variety has a less attractive appearance which does not, however, affect oil content.

It is interesting to examine the distribution of the three grades of copra by province (Table 73). This shows that the proportion of smoke copra is particularly high in just three places, Samarai (98.5 per cent), Kandrian (94.3 per cent) and Alotau (93.6 per cent), while in other areas the percentage is as low as 4, 5 or 6 per cent. There are therefore clear geographical reasons for high proportions of smoke, not associated with the care applied by individuals. It is evident that this is not associated with the care in processing applied by individuals in these places but is related to factors operating in those geographical localities. This implies that application of a discount for one grade penalises one set of growers, reducing their incomes relative to others, without their having the capacity to respond to the incentive to change their method of processing.

A real quality problem which does exist in respect of copra is in the outlying islands, where growers may not be able to secure sea transport for several months, and in areas suffering from lack of road access. There remains a serious problem relating to sea transport costs and schedules (Jackman 1987). In 1987 an entire shipload from Walis Island was rejected at Wewak. New consideration needs to be given to this problem of sea transport, particularly where it affects large groups of people. A premium between grades, again, bears no relevance to this problem.

The premium, or discount in the case of smoke grade suppliers, is not large. Nevertheless it makes a difference to the net grower prices calculated earlier for different locations (Table 26) of between 3 and 6 per cent. In the past, however, very large premia were in place, the peak being a differential between smoke grade and

fair merchantable standard of K45 per tonne, very different from the present K2. The break in policy evidently came in 1982 (Table 9) when the premium dropped from K16 to K2, although as late as 1985 a differential between these two grades existed of as high as K7 per tonne, with an even greater one between hot air and smoke. The present policy should be to abolish premia or to maintain them at no more than a nominal level.

A further question is whether Papua New Guinea, which already processes and exports coconut oil as well as copra, could not exploit more fully the range of potential coconut products. As Jackman points out, in comparison Sri Lanka exports only 4 per cent of its production of copra, producing substantial quantities of coconut oil for domestic production but also exporting 30,000 tonnes of desiccated coconut and a large volume of fibre, 97,000 tonnes in 1984 (Table 74).

Table 72
Copra Marketing Board : unit costs of selling
and administration, 1976 - 1987

Year	Quantity handled (tonnes)	Total selling and administration costs (Kina)	Unit selling and administration costs (Kina/tonne)
1976	123,252	2,245,228	18.2
1977	134,004	4,188,268	31.3
1978	145,927	4,188,056	28.7
1979	160,136	4,449,212	27.8
1980	148,373	3,067,525	20.7
1981	146,840	3,403,539	23.2
1982	133,199	2,504,737	18.8
1983	133,681	2,902,334	21.7
1984	153,323	4,819,632	31.4
1985	175,833	4,860,561	27.6
1986	158,492	2,958,968	18.7
1987	149,317	3,263,928	21.9

Source: Copra Marketing Board.

Table 73
Copra Marketing Board : receipts of copra, by grades,
1986

Depot/Agency	Hot air (tonnes)	Fair Merchantable Standard (tonnes)	Smoke (tonnes)	Proportion of smoke (per cent)
Alotau	123	348	6,977	93.6
Buka	3,492	5,356	947	9.7
Finschhafen	689	69	22	2.8
Kandrian	13	17	493	94.3
Kavieng	8,196	2,434	3,288	23.6
Kieta	13,322	1,836	822	5.1
Kimbe	6,837	988	6,267	44.5
Lae	1,854	364	588	21.0
Lorengau	532	197	30	4.0
Madang	17,280	5,244	3,096	12.1
Namatanai	1,777	796	1,274	33.1
Port Moresby	2,993	462	545	13.6
Rabaul/Toboi	30,533	16,821	3,085	6.1
Samarai	-	4	263	98.5
Wewak	2,212	391	455	14.9
Total (tonnes)	89,853	35,327	28,212	18.4
(per cent)	58.6	23.0	18.4	-

Source: Copra Marketing Board.

Table 74
Production and export of coconut products
from Sri Lanka, 1984

Producer	Production (tonnes)	Export (tonnes)
Copra	62,295	2,440
Coconut oil	36,834	7,606
Dessicated coconut	32,518	30,099
Bristle fibre	8,381	8,381
Mattress fibre	35,972	35,972
Twisted fibre	25,583	25,583
Shell charcoal	27,174	27,174
Shell powder	371	371
Activated carbon	1,713	1,713

Source: Jackman (1987)

Chapter 16

NEW ENTREPRENEURS? PROCESSORS AND TRANSPORTERS

As was observed at the outset, the development of smallholder cocoa production is relatively recent economic history in Papua New Guinea, covering the last fifteen years or so. Plantation owners have not needed to rely on market intermediaries, generally being able to transmit their output directly to the export point. It is an interesting question to ask whether and how the market intermediaries have emerged to handle the smallholder crop in the case of both cocoa and copra, particularly since restrictions were imposed some years ago limiting immigrant traders to the towns. If it is going to be necessary to rely in the future on the "informal sector" for the processing and transportation of these crops, it is worth examining who these rural processors and transporters are, and whether they exhibit any features to distinguish them from other villagers.

As far as age is concerned, fermentary owners do not differ from villagers as a whole (Table 75), except that very few are below the age of 30. Copra drier owners are on the whole rather older than villagers as a whole, suggesting that they may be villagers who have been based in the village and accumulated the necessary assets or savings over time. Transporters are in the two intermediate age groups 30 - 49, this business being perhaps too strenuous for the oldest age group.

Looking at the educational backgrounds (Table 76), the fact that copra drier owners are no more educated than villagers as a whole confirms that these are essentially village-based people with perhaps somewhat higher levels of agricultural income. Fermentary owners, in contrast, are clearly more educated, a high proportion having at least Standard 8 education, though the sample here is small. Transport operators are marginally better educated, with a higher proportion, 56 per cent compared with 45 per cent, of Standard 6 or above.

This might be linked in part to access to formal sector or other paid employment as a source of savings for entry into business. A minority of these "entrepreneurs" are currently employed, but a significantly higher proportion, 83 per cent, of fermentary owners especially, and also of copra drier owners have previously been employed, compared with ordinary villagers (Table 77). This was not the case with transport operators. It is striking that as many as 60 per cent of villagers have previous paid employment experience. As far as the generation of savings are concerned, however, the nature of the employment may make a critical difference, whether it is high-paid formal sector or urban employment or casual labour in the plantations.

Earnings from employment were indeed an important source of finance for fermentary facilities and for vehicles (Table 78), especially as "contributions from relatives and friends" are in many cases assistance by those themselves in employment. Bank loans are also an important source, however, and given the emphasis we have placed on the role the informal or small-scale sector will have to play, there is a need for a very positive approach to lending to small-scale rural enterprise. All the evidence is that the banks, including the Agriculture Bank, pursue a very conservative course and are not well-organised for lending to this sector. Whether institutional change in this direction is required should be investigated.

Table 75
Age distribution of fermentary owners, copra drier owners and transporters

Age	Fermentary owners		Copra drier owners		Transporters		Other villagers	
	No.	per cent	No.	per cent	No.	per cent	No.	per cent
20-29	2	11.1	12	15.8	4	9.8	55	20.1
30-39	7	38.9	20	26.3	16	39.0	87	31.8
40-49	5	27.8	25	32.9	19	46.3	78	28.5
50 & over	4	22.2	19	25.0	2	4.9	54	19.7
Total	18	100.0	76	100.0	41	100.0	274	100.0

Note: 1. May also own copra driers and sometimes have transport business.

Table 76
Educational background of fermentary owners, copra drier owners and transporters

Education (No. of years)	Fermentary owners		Copra drier owners		Transporters		Total three categories		Other villagers	
	No.	%	No.	%	No.	%	No.	%	No.	%
Mission/bible school only	0	20.0	3	24.3	0	9.7	3	20.0	14	28.4
Preparatory or miscellaneous education	0		4		1		5		9	
	0		9		1		13		50	
	1	6.7	2	27.0	1	25.8	3	24.2	3	26.9
	2		2		0		3		10	
	3		11		4		15		30	
	4	33.3	4	32.4	1	38.7	5	34.2	11	26.5
	5		3		3		6		21	
	6		24		12		41		71	
	7	0.0	4	8.1	0	16.1	4	9.2	3	4.9
	8		2		5		7		10	
	9		3		1		6		14	
	10	40.0	2	8.1	1	9.7	5	12.5	19	13.4
	10		2		1		5		19	
Beyond	10		1		1		4		3	
Total	15	100	74	100	31	100	120	100	268	100.0

Table 77
Employment status of fermentary owners, copra drier owners and transporters
in two survey areas

Employment Status	Fermentary owners (1)	Copra drier owners (2)	(1) + (2) = (3)	Transporters (4)	(1) + (2) + (4) = (5)	Other villagers (6)
Person is at present employed						
Yes	3	9	12	2	14	32
No	15	66	81	30	112	241
Per cent yes	16.7	12.0	12.8	6.3	11.1	11.7
Person was previously employed						
Yes	15	50	65	17	82	151
No	3	25	28	16	44	103
Per cent yes	83.3	66.7	69.1	51.2	65.1	59.4

Table 78
Sources of finance for investment by fermentary owners and transporters

Source of capital	Fermentary owners for processing facilities		for vehicles		Transporters for vehicles		Total	
	No.	per cent	No.	per cent	No.	per cent	No.	per cent
Savings - agriculture/fishing	9	25.0	4	20.0	16	29.6	29	26.4
Timber royalties	1	2.8	0	0	2	3.7	3	2.7
Savings from trade	2	5.6	0	0	4	7.4	6	5.5
Earnings from trade store	2	5.6	1	5.0	3	5.6	6	5.5
Earnings from employment	5	13.9	5	25.0	10	18.5	20	18.2
Contribs. - friends/relatives	5	13.9	3	15.0	5	9.3	13	11.8
Bank loan	10	27.8	6	30.0	11	20.4	27	24.5
Savings and loan society	1	2.8	0	0	0	0	1	0.9
Company loan	0	0	1	5.0	0	0	1	0.9
Village group loan	1	2.8	0	0	1	1.9	2	1.8
Other loan, unspecified	0	0	0	0	1	1.9	1	0.9
Earnings from "Fire Dance"	0	0	0	0	1	1.9	1	0.9
Total	36	100.0	20	100.0	54	100.0	110	100.0

Chapter 17

RURAL NON-FARM ACTIVITIES IN PAPUA NEW GUINEA

Part of the case made earlier for an emphasis within export crop production on the smallholder mode, in the context of Papua New Guinea, was that this would be an important means of achieving involvement of the rural population in the development process, in contrast with the limited impact of plantation and/or mineral export enclaves, would help to pay for the construction of a communications infrastructure, and would generate linkages in the form of non-farm activities. While investigation of these is beyond the immediate scope of the present study, some relevant information was collected, not very systematically, in the course of the survey, by asking villagers what sources of earned income they enjoyed, other than from crops (Table 79).

The two dominant activities appear to be the operation of trade stores and copra drying (the figures for the latter excluded copra driers run for the personal use of their owners, without profit). The figures for trade store ownership need to be treated with caution : assuming the villagers covered here were selected at random, the high proportion of trade-store owners in the sample for specific villages (for example six in Poro compared with only nine villagers without any sources of non-farm income) suggests that in a number of cases village stores were owned on a cooperative basis by a group of individuals. This was directly indicated in a proportion of the interviews.

Despite this qualification, the figures really show a quite overwhelming predominance of these two activities. The importance of copra drying requires no explanation, though one might not have expected the activity to stand out from the rest (except stores) in this way. The importance of trade stores in the villages probably reflects (a) the isolation of these from major townships; (b) consumer tastes in favour of imported tinned goods, which are widely distributed in rural Papua New Guinea; and (c) the absence of an immigrant trading class, which often dominates retail good distribution in other less developed countries.

As stated previously, it was not the intention to carry out a systematic survey of rural non-farm activities and there may be significant omissions in the results obtained. Thus, given the relatively good standard of rural housing in Papua New Guinea, one would have expected to find a significant number of carpenters and joiners : this was not indicated by many villagers as an additional source of income. There was a virtual absence of tailoring, perhaps the most common rural manufacturing activity in many developing countries, associated possibly with a general tendency to purchase imported clothing.

Clearly much closer investigation of rural non-farm activity is needed, together with an assessment of training requirements or other policy measures required. The impression provided by the present data is of rather limited development of such activity.

Table 79
Secondary activities carried on by rural householders in the areas surveyed

	Transport- ing	Boat hire	Ferm- entary	Copra dry- ing	Trade store	Group trade store	Second- hand clothing sales	Canteen or sale of petrol club	Video show- ing club	String band	Fish- ing	Prawn fish- ing	Poul- try	Pigg- ery	Sale of meat	Cattle	Nil
Vunadidir	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	7
Malabunga	1	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	12
Gaulim	-	-	-	1	1	-	-	-	-	1	-	-	1	1	-	-	11
Taulil	-	-	1	2	4	3	-	-	1	-	-	-	-	1	-	-	4
Vunga	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	15
Karawop	-	-	-	3	7	-	1	-	-	-	-	-	2	1	-	-	11
Boiken	1	-	-	3	3	-	-	-	-	-	-	-	1	1	-	-	5
Lowan	1	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	12
Bal	-	-	-	4	3	-	-	-	-	-	-	-	-	1	-	-	1
Kauk	-	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	4
Sowan	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	3
Swain	-	-	-	6	4	-	-	-	-	-	-	-	-	2	-	-	24
Paup	1	-	-	4	3	-	-	-	-	-	-	-	1	-	1	-	9
Siunte	-	-	-	-	5	-	-	1	-	-	-	-	2	1	-	1	11
Tumleo	-	1	-	1	-	-	-	1	1	-	7	-	-	-	-	-	3
Mallol	-	-	-	1	4	-	-	-	1	-	-	1	-	-	-	-	13
Poro	1	-	-	-	6	-	-	-	-	-	-	-	-	1	-	-	9
Romei	-	-	-	-	3	-	-	-	-	-	-	-	1	-	-	3	14
Warapu	1	2	-	-	2	-	-	-	-	-	11	-	-	-	-	-	8
Sissano	-	2	-	2	1	-	1	-	-	-	5	-	1	1	-	1	10
Waramo	-	-	-	-	-	-	-	-	-	-	7	-	2	1	-	-	4
Ossima	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	7
Total	7	5	1	39	56	3	2	4	2	3	2	1	30	1	11	1	5 197

Chapter 18

PROBLEMS IN THE MARKETING OF FOOD CROPS

The focus of the present study is on the marketing of two export crops, cocoa and copra. Nevertheless the opportunity was taken in the course of the survey to collect some information on the situation with respect to food crops.

Three questions posed on the questionnaire were closely related. The first asked villagers to identify the major problems they faced in selling food crops (without any checklist of possible answers). The second asked them to cite the major reasons for not selling more (largely, but not entirely a restatement of the problems faced in selling), and the third asked more specifically what would induce them to sell more food crops (one would anticipate this to be a resolution of the same problems).

The responses to these questions (Tables 80, 81 and 82) revealed two categories of problem, demand-related and transport-related. It is lack of demand, first and foremost, that prevents most villagers earning more income from the sale of food crops. Very often they had to return home from market at the end of the day not once but several times without having disposed of the surplus which they had available, with most villagers attempting to sell the same range of produce. The main markets are the urban townships, but here the demand is invariably rather narrow. The fact that transport costs are a major problem in selling high-valued export crops, seriously reducing net grower prices, suggests this will be even more true in the case of perishable and lower-valued food crops, particularly vegetables.

It is useful to look at how the produce is carried to the point of sale (Table 83). In 25 per cent of the cases it was hand-carried, implying obviously this proportion of sales in local village markets which are near at hand. Another 39 per cent was taken by PMV, the informal sector vehicle again, suggesting the produce is accompanied by the grower or someone on his behalf, to the urban market for sale. This again implies an absence of bulk-building which would not be unusual in developing countries as far as fruit and vegetables are concerned. Other information (Table 84) confirms that the produce was generally sold by the wife, mother or other "womenfolk": less than 4 per cent to small traders.

The finding which needs most to be emphasised, however, is that local market demand saturation is the greatest constraint, suggesting that the scope for raising agricultural incomes by developing these crops is circumscribed, and the need to raise incomes through the expansion of export crops all the greater.

Table 80
Major problems in selling food crops as cited by village producers

Problem	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	per cent
<u>Demand-related</u>	<u>68</u>	<u>54</u>	<u>41</u>	<u>17</u>	<u>37</u>	<u>217</u>	<u>45.3</u>
Insufficient consumer demand/can't always dispose of the crop at market	54	33	21	7	18	133	
Unsold surplus is wasted or taken back home	7	9	11	5	11	43	
Unsold surplus/too much competition in selling same foodstuffs	1	7	4	4	4	20	
Low food prices	5	5	5	1	4	20	
Price goes down as day goes on	1	-	-	-	-	1	
<u>Transported-related</u>	<u>38</u>	<u>56</u>	<u>60</u>	<u>35</u>	<u>11</u>	<u>200</u>	<u>41.8</u>
Transport problem/unreliable transport system	16	38	42	24	9	129	
Cost of transport	20	13	16	9	2	60	
Fixed cost of transport irrespective of size of consignment	1	-	-	-	-	1	
Deterioration of crops in transit	1	5	2	2	-	10	
<u>Supply-related</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>6</u>	<u>7</u>	<u>1.5</u>
Don't produce enough	1	-	-	-	6	7	
<u>Security-related</u>	<u>17</u>	<u>10</u>	<u>3</u>	<u>-</u>	<u>-</u>	<u>30</u>	<u>6.3</u>
Fights, bra'wls, security problems	12	7	3	-	-	19	
People grabbing food without payment	5	3	3	-	-	11	
<u>Market infrastructure</u>	<u>4</u>	<u>8</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>19</u>	<u>4.0</u>
No proper market to sell food crops	-	7	3	-	1	11	
Improved facilities at market	-	-	2	1	-	3	
Can't get good place to sell after 9 a.m.	2	1	-	-	-	3	
Lack of shelter for mothers against sun & rain	1	1	-	2	2	6	
<u>Miscellaneous</u>	<u>-</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>1.3</u>
Cost of market fee	-	-	-	-	-	-	
DPI not buying on time	-	-	-	-	-	-	
Ignorance of prevailing price leading to possible cheating	-	-	-	-	-	-	
Customers only select best items	-	-	-	-	-	-	
No wife to do the selling	1	-	-	1	-	2	
Total	129	129	109	55	57	479	100.0

Reason	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	Total per cent
<u>Demand-related</u>	<u>77</u>	<u>61</u>	<u>33</u>	<u>15</u>	<u>21</u>	<u>207</u>	<u>53.5</u>
Inadequate consumer demand	25	37	17	5	16	100	
Inability to sell all produce	24	1	6	3	-	34	
Too much of same produce in market	7	10	5	5	3	30	
Low prices	21	7	1	-	2	31	
No good sales outlet	-	3	1	-	-	4	
Surplus sometimes given free to relatives, friends	-	3	3	2	-	8	
<u>Transport-related</u>	<u>33</u>	<u>33</u>	<u>31</u>	<u>22</u>	<u>-</u>	<u>119</u>	<u>30.7</u>
Transport problems, difficulties of securing transport, unreliable transport	18	27	21	15	-	81	
Costs of transport	13	5	9	6	-	33	
Fixed cost of transport relative to size of consignment	1	-	-	-	-	1	
Deterioration of crops in transit	1	1	1	1	-	4	
<u>Supply-related</u>	<u>22</u>	<u>4</u>	<u>4</u>	<u>-</u>	<u>7</u>	<u>37</u>	<u>9.6</u>
Inability to increase output of garden land shortage	10	-	1	-	6	17	
Labour shortage	6	-	-	-	-	6	
Lack of fertiliser	3	-	-	-	-	3	
No money to buy seeds	-	-	-	-	1	1	
Would not want to sell more	1	-	-	-	-	1	
Only sell what is surplus	-	1	-	-	-	1	
Quality of produce sold at market	-	3	3	-	-	6	
<u>Security problems</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>-</u>	<u>-</u>	<u>8</u>	<u>2.1</u>
<u>Market infrastructure</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>-</u>	<u>8</u>	<u>2.1</u>
No market nearby	-	1	-	3	-	4	
No enough space at market	2	1	-	-	-	3	
No toilet, night facilities	-	-	1	-	-	1	
<u>Miscellaneous</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>-</u>	<u>8</u>	<u>2.1</u>
Floods, bad weather	-	-	1	1	-	2	
Illness	2	-	-	-	-	2	
Cost of market gate fee	-	1	-	-	-	1	
DPI not buying on time	-	-	-	-	-	1	
No wife, relatives to do selling	1	-	-	1	-	2	
Total	141	104	71	43	28	387	100.0

Factors which sellers indicate would induce them to sell increased amounts of food crops

Factor	East New Britain	East Sepik	West Sepik coast	West Sepik inland	West Sepik far west	Total
	No.	No.	No.	No.	No.	per cent
<u>No response</u> : sells surplus without eye to profit	1	-	-	-	1	0.3
<u>Demand/price factors</u>	61	37	31	10	20	159
Higher demand/price	49	36	26	8	17	136
Full disposal of crop	10	-	3	1	2	16
Less competition among sellers	2	-	-	-	-	2
Not having to sell same crop as others/ having crop that sells faster	-	1	-	1	-	2
Increased size/economic activities in Aitape	-	-	2	-	-	2
Purchase by major institutional buyers, Defence, hospital, companies, etc.	-	-	-	-	1	1
<u>Transport factors</u>	29	27	40	14	4	114
Improved transport system	18	23	31	11	4	87
Cost of transport/can lose money in selling	9	3	8	3	-	23
If owned own transport	2	1	1	-	-	4
<u>Improved security</u>	3	6	1	-	-	10
<u>Market facilities</u>	1	1	-	1	2	5
Large market nearby/trying to set up local market/carry more to major market	1	1	-	1	-	3
D PI assist. marketing/D PI not buying in time	-	-	-	-	2	2
<u>Easing of supply constraints</u>	6	1	1	1	3	12
Ability to produce more	-	1	-	-	1	2
More land	2	-	-	-	-	2
More labour/assistance from relatives	2	-	-	-	-	2
Finance	1	-	-	1	-	2
More fertiliser supplies	1	-	-	-	-	1
More seed provision by D PI	-	-	-	-	2	2
Advice from D PI (didimen)	-	-	1	-	-	1
<u>Miscellaneous</u>	7	2	-	1	-	10
Wife/wantoks to help sell crop	2	-	-	-	-	2
Improved health	2	-	-	-	-	2
Better education/market knowledge	1	-	-	-	-	1
Increase in family size	-	2	-	-	-	2
Improved quality of produce	-	-	-	1	-	1
Locally available storage	2	-	-	-	-	2

Table 83
Mode of carriage of food crops to point of sale

Mode	East New Britain No.	East Sepik No.	West Sepik coast No.	West Sepik inland No.	West Sepik far west No.	Total No.	per cent
Hand carried	12	13	13	8	38	84	25.1
PMV	14	36	41	25	16	132	39.4
Paid transporter	21	9	9	3	2	44	13.1
Friend with pickup	28	6	1	-	-	35	10.4
Own transport	7	2	4	-	12	25	7.5
Village truck	5	7	3	-	-	15	4.5
Total	87	73	71	36	68	335	100.0

Table 84
How were your food crops sold?

Method	No.	Per cent
Directly by the farmer himself	44	18.5
Directly by the farmer and his wife	1	0.4
Directly in the market by wife, wife with children, sister	141	59.5
Directly in the market by mother or mother-in-law or children or sister	9	3.8
Directly in the market by the "womenfolk"	33	13.9
Total	237	100.0

Chapter 19

FINDINGS AND RECOMMENDATIONS

Findings

1. Smallholder production of cocoa has increased in an important way since the 1960s, but progress has not been steady over time, slowing down after 1982-3, or geographically, many provinces showing either a negligible increase or actual decrease. The required frontal assault in the promotion of smallholder cocoa has not yet been launched.
2. Plenty of evidence exists, supported here by the survey results, of the supply responsiveness of growers of cocoa and copra, and policies in future should be based on the assumption of positive supply response and economic motivation in both cases.
3. Only 17 per cent of growers in the survey stated that they were harvesting all their copra in the face of current low prices.
4. The 32 per cent of growers in the survey stating that they were not harvesting all their cocoa is surprisingly high and is a matter for concern.
5. The critical constraints on cocoa and copra supply, judged from survey responses, are, in order, price, transport problems, and labour constraints, with crop diseases also in East New Britain.
6. A remarkable feature of the marketing system in Papua New Guinea in the case of both cocoa and copra is the absence of "bulk-building" under which economies of scale are achieved in transportation and handling.
7. A feature of transport charges in the Gazelle Peninsula is that a standard 10 per cent charge is made for carrying cocoa irrespective of distance, with the effect that growers farther from Rabaul are subsidised and those within closer reach are penalised.
8. The movement of very small consignments even over relatively short distances reduces by significant amounts the net grower price per kilo.
9. Transport charges from offshore islands, even when these are physically close to the export point, reduce the net grower price enormously, especially for small consignments.

10. For locations away from the developed north-east portion of the Gazelle all net grower prices are negative, and substantially so.
11. The passenger fare element associated with passengers accompanying their produce to the nearest main town or export point is a major factor in reducing net grower prices.
12. Overland transport costs are high relative to those by sea from established ports.
13. As a result remoteness in the sense of distance from major ports need not be a major handicap so long as the grower is within relatively easy reach of a subsidiary port locally.
14. Hence it should not be too difficult in principle to develop cocoa and copra around the perimeter of Papua New Guinea and away from the present areas of concentration, in enclave areas surrounding subsidiary ports.
15. Contrary to suggestions, free assistance from friends or relatives in taking produce to the point of export is not important, and commercial payment is involved even over short distances and for very small quantities.
16. Transport problems in East and West Sepik are imposing major costs on growers through spoiled or lost cocoa wet beans.
17. Different licensing policies towards fermentaries have been practised by the Cocoa Board in East New Britain and in East and West Sepik.
18. Substantial economies of scale in cocoa processing do not appear to exist, and small-scale fermentaries, if not the smallest village fermentaries, appear to be fully competitive. The most economic size will depend on relative transport costs for wet and dry bean as well as on processing costs themselves, and therefore on the distance between producing area and the point of export.
19. Calculations suggest that in some of the locations observed establishment of a small local fermentary could be to the substantial benefit of growers through net reductions in transport cost.
20. A large number of other potential advantages exist from a liberal licensing policy and the associated decentralised system of cocoa processing which would result.

21. There is no evidence of a quality problem warranting a restrictive policy towards fermentary licensing. Problems tend to occur at a specific fermentary at a specific time for particular reasons, usually a management problem.
22. The incidence of disease affecting cocoa trees in East New Britain is alarming and a much more important cause of quality problems.
23. The legalisation of dealing in dry bean would contribute to reducing the proportion of cocoa being transported as wet bean. It should not lead to any unnecessary increase in the number of middlemen involved in marketing.
24. Sun-drying of cocoa is effectively carried out by smallholders in other developing countries and could be encouraged here with advice from extension officers. A wider network of small fermentaries in a position also to buy dry beans might facilitate this development.
25. There is an exceptionally high rate of turnover among small fermentaries in East New Britain, with 21 per cent of the fermentary dealers and 46 per cent of fermentaries in the Gazelle surviving no more than one or two years.
26. The purchase of cocoa for export is highly concentrated, with one dominant and just two other major companies.
27. Despite this, there is an element of competition among exporters for volume to take advantage of low marginal costs in cocoa handling.
28. There is a considerable degree of price uniformity between the cocoa exporting companies with prices paid moving up and down together.
29. An aspect of price policy which is not readily explained is the variation between exporters in the difference between prices paid at main ports and subsidiary ports.
30. As a result of negative experiences, the extension of crop finance by exporters has been cut back in recent years. Default rates of 25 per cent have been reported.
31. Differential access to crop finance by the larger urban-based dealers may contribute to their securing a market advantage, particularly in terms of volume of throughput.

32. There have been significant changes in market structure in cocoa marketing below the export level in East New Britain as a result of an increase in the number of small fermentaries and the increasing market share acquired by the New Guinea Islands Produce Company (NGIP). This has widened the choice open to growers for the disposal of their cocoa.
33. The same trends can be expected elsewhere if similar policies are pursued. The dominance of the Sepik Cocoa Growers Association (SCGA) in East Sepik, for instance, may be expected to decline over time.
34. The rise of NGIP underlines the importance of management to good performance among larger companies and associations.
35. Among the major dealers in East New Britain there appears to be a situation of "workable competition", although a degree of discretionary power to fix prices also exists which may be associated with elements of spatial monopoly.
36. Small village fermentaries are often in a weak state, reflected in the high rate of turnover. It is uncertain which of several possible reasons are responsible.
37. However, price determination by owners of small village fermentaries in East New Britain appears quite erratic and could be an important factor in at least a proportion of cases.
38. Price determination by the SCGA in East and West Sepik also appears to have lacked rationale over an extended period of years.
39. In East and West Sepik as a whole, the overall impression is of a non-competitive market with a substantial degree of arbitrariness in the prices received by growers in different localities and over time, though the recent increase in the number of small fermentaries in the region is likely to improve the situation over time.
40. The cocoa stabilisation scheme has contributed to a substantial reduction in price instability as indicated by the much lower level of variation in the f.o.b. export price including bounty compared to that without.
41. Variations in exporters' and dealers' margin, especially the former, also contributed to stability in the price paid to growers.

42. The competitiveness of the cocoa marketing structure as a whole in East New Britain may be measured by analysing the extent to which changes in export prices including the bounty payments received by exporters are transmitted first to major dealers and then to growers. Regression analysis of unlagged monthly data suggested some 40 per cent of changes in export price or bounty would be passed through to growers, with 66 per cent being passed from exporter to dealer and 26 per cent from dealer to grower, all these estimates, especially the last, being subject, however, to sampling error and ignoring time lags.
43. By taking moving average values of the price series to represent trends, new equations were estimated suggesting that, allowing for lags, as much as 74 per cent (plus or minus substantial sampling error) would be passed on from exporter to grower, 67 per cent from exporter to dealers and 43 per cent from dealer to grower. This suggests that competition is rather weaker and discretionary pricing power greater among dealers than among exporters, despite the lesser apparent degree of market concentration at this level.
44. The lack of bulk-building in the marketing system points to cooperatives and business groups or some kind of joint village action being given very serious consideration, however chequered their experience in Papua New Guinea.
45. We need to distinguish between large associations of village groups and independent business groups and cooperatives. The former have in some cases played pioneering roles in establishing the production of cocoa in the villages.
46. Our rural survey showed business groups to be much more popular than cooperatives among villagers. It is clear that bad experience with management problems and conflict of interest have tarnished the reputation of cooperatives among villagers, as well as among policy-makers, who now generally favour business groups.
47. In fact, however, many of the so-called business groups are actually cooperatives in the sense of being based on wide memberships of sixty, eighty or a hundred people.
48. One advantage of roadside buying is that it provides an element of bulk-building, which makes for fuller utilisation of vehicles and the elimination of the passenger fare element, which should substantially reduce costs.
49. A major advantage for the grower is that it does not penalise small lots.

50. The actual prices paid by roadside buyers in locations served by them, whether or not these are fixed at economic levels as far as the buyers are concerned, are much higher than would exist in their absence.
51. The development of a marketing and processing system based on distributed small fermentaries is likely to progressively erode the extent of roadside buying and the distances over which wet bean is carried.
52. The ownership of cocoa and even coconut trees in both the survey areas is highly stratified.
53. The record of settlement schemes for cocoa production is unimpressive and does not suggest they are well designed to produce wide and effective participation by villagers or the highest rate of overall increase in production.
54. Prices paid for cocoa at DPI buying points where these have been set up have been out of line regionally between provinces and with free market prices over most of the period considered, and have constituted a major subsidy to grower.
55. Copra drying is a comparatively simple process compared with that for cocoa, can be carried out at village level, and does not complicate the marketing structure in the same way as cocoa processing.
56. While some free use of driers by friends and relatives is allowed, drying facilities are generally available on a strictly commercial basis.
57. The charges amount to a not insignificant deduction from the gross payment to growers, over and above transport costs, and the full costs are even greater when fuel, generally provided by the user, is taken into account, perhaps as much as 20 per cent of the final sale price.
58. The main problems faced by growers in drying copra, as stated by them, are labour costs, difficulties in securing firewood, transport costs and the poor condition of many of the constructed processing facilities.
59. Rather surprisingly, no roadside buying of copra has developed, and few market intermediaries between village grower and the Copra Marketing Board (CMB) depot have emerged.
60. Such dealers as exist currently regard trading in copra as a loss-making or at best break-even activity carried on as a favour to growers.

61. There has been no secular tendency for the CMB's unit selling and administration costs to increase, suggesting that the CMB has been performing its own set tasks well enough.
62. There is no general problem of quality affecting Papua New Guinea's copra. Variations in the percentage of smoke and other grades can be explained largely by geographical factors.
63. A specific problem does affect production in outlying islands and other less accessible areas, due to the transport factor.
64. As a social category, copra drier owners are essentially village-based people, with somewhat higher than average levels of agricultural income; fermentary owners are more educated, a high proportion having at least Standard 8 education. A high proportion of fermentary owners have a background of paid employment.
65. Earnings from employment are an important source of finance for fermentary facilities and for vehicles. Bank loans are also an important source however.
66. The rural survey suggested that, in terms of numbers of villagers involved, the two most important rural non-farm activities were the operation of trade stores and copra drying, though the figures for the former may be exaggerated as a result of group ownership of stores.
67. The general impression is of rather limited development of rural non-farm activity. Compared with other developing countries there is a noticeable absence of tailoring in the rural areas.
68. Lack of market demand is the major obstacle to villagers earning more income from the sale of foodcrops. Villagers frequently return home from urban markets having failed to dispose of their products.
69. There is again an absence of bulk-building in the marketing of market produce and other food crops, most sellers (generally the wife) accompanying the produce to market and selling it in person.

Recommendations

1. The scope identified for developing export production in enclave areas around subsidiary ports suggests that the CMB should adopt a more positive policy towards establishing sub-depots, if more economic on an agency basis, in these enclaves.
2. In remote cocoa producing centres such as Pomio the establishment of a small fermentary or, failing that, the purchase and despatch of wet beans by a primary buyer should be encouraged, in order to reduce transport costs. Failing that again, assistance by the extension service in organising despatch on a periodic basis by groups of growers is justified. In respect of copra, the adequacy of village processing facilities in remote locations and islands should be reviewed where problems of shipment have led to effects on quality in the past.
3. "Informal sector" means of transportation such as the PMV are important and should be promoted e.g. by facilitating the hire purchase of more PMVs within the limits justified by market demand.
4. A more flexible approach by relevant bodies should be adopted towards encouraging the use of backhauls for the movement of export crops.
5. Consideration should be given by the CMB, with the cooperation of DPI, to the organisation of regular, periodic runs through the major villages to collect the considerable unmarketed volume of copra which appears to exist in East and West Sepik and similar regions where transport has been the deterrent.
6. Rather than attempt to inspect all fermentary premises annually, the Cocoa Board should adopt a statistical monitoring system, using non-export quality deliveries as an index, and a fire-fighting approach for immediate remedial action where a problem has been diagnosed, this in conjunction with DPI officers who know the local situation.
7. There is a continuing programme of research into disease-tolerant varieties of cocoa (and copra) but more effort, and perhaps a new approach, are needed in agricultural extension in order to secure improved crop husbandry.
8. The Cocoa Board should devote a greater proportion of its limited resources to finding the means to increase the volume as opposed to the quality of what is produced, e.g. by monitoring the development of nurseries and encouraging the wider distribution of processing facilities.
9. The Cocoa Board requirement of a 5,000 tree minimum holding for the issue of a fermentary licence should be abolished and issue should be divorced from the question of number of trees owned and made on purely business criteria as with any other business enterprise.

10. Assistance in establishing small fermentaries should be stepped up through the extension service, using where appropriate, standard designs such as the model low-cost pre-fabricated fermentary developed under SCREPP.
11. Free dealing in wet bean should be permitted in order to increase competition and allow small fermentaries to improve capacity utilisation and to encourage rural transporters to become more directly involved as primary traders buying the wet bean for resale, reducing also the passenger element in cocoa marketing.
12. The differential between the fermentary licence fee of K30 and that for a fermentary dealer of K90 should be abolished, and licences issued more freely. However, the revenue objectives of charging dealer licence fees could be maintained by raising charges specifically on those fermentaries which have large turnovers.
13. Dealing in bagged dry bean should be legalised.
14. Where climatic conditions are suitable sun-drying of cocoa during the dry season should be encouraged with the assistance of extension officers.
15. The causes underlying the exceptionally high rate of turnover among fermentaries and fermentary dealers in East New Britain and other parts of Papua New Guinea should be investigated and appropriate action taken in the areas of advice and monitoring.
16. Energetic encouragement of entry into the export trade by qualified companies is needed to stimulate competition.
17. A more energetic, critical but positive, approach should be adopted towards village groups, treated on their individual merits, without preconceptions based on whether they fall under the definition of cooperative or business group. Clearer guidelines should be prepared for their size and operation and closer monitoring initiated of their performance.
18. Cocoa production in new regions can be accelerated through an approach similar though not necessarily identical to that of large associations such as Sepik Cocoa Growers, used as a mechanism for the mobilisation of growers and rapid establishment of market infrastructure in the absence of a network of traders.
19. Large cooperative associations such as the SCGA should concentrate on processing and internal marketing activities and not attempt to enter the more specialised business of exporting.

20. Consideration should be given to streamlining the operations of the SCGA which has become too unwieldy, by hiving off a proportion of villagers to form their own association.
21. A frontal approach to the development of cocoa in new areas of production is required with the widest possible participation by villagers rather than by narrow schemes based on excessively large individual cocoa blocks, though these may be appropriate in particular situations.
22. Cocoa nurseries are essential to such a frontal approach aimed at participation by the maximum number of growers and should constitute a key component.
23. The approach should be based on group extension using village units.
24. In fixing prices at DPI cocoa and copra buying points closer communication is needed between the Department of Agriculture's Marketing Section at Konedobu and local officers in the field to determine realistic processing, transport and handling costs from the buying point to the depot or point of shipment.
25. A reporting system under which actual prices paid at buying points are reported back to headquarters should be instituted. Relevant private sector prices should also be reported and taken into account.
26. Direct price subsidy should be minimised in this process and finance directed rather towards subsidisation of extension services, government nurseries and the distribution of seedling at nominal prices in order to target assistance to those in greatest need and towards expanding the area under high-valued export crops.
27. Given the quite substantial costs of copra drying, despite the appropriate village technology employed, attention does need to be paid to the efficiency and effectiveness of village processing. A modest programme of assistance for individual or group-owned units should be instituted.
28. In copra marketing, changes in organisation might help to reduce transport costs, for instance bulk collection of copra in the villages by the CMB or appointed agents, or more effective bulk-building through village groups, hiring their own transport, are worth exploring.
29. New consideration needs to be given to the problem of sea transport affecting outlying islands, especially where it affects large groups of people.

30. There is a weak case for maintaining price differentials between various copra grades. The present policy should be to abolish premia or to maintain them at no more than a nominal level.
31. The possibilities of diversifying exports by exploiting more fully the range of potential coconut products should be explored.
32. There is a need for a more positive approach towards lending to small-scale rural enterprise where the evidence is that the banks, including the Agriculture Bank, pursue a very conservative course. Whether institutional change in this direction is required should be investigated.
33. A much more systematic survey of rural non-farm activity is needed together with an assessment of training requirements or other policy measures.

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Appendix

CALCULATION OF WET AND DRY BEAN PRICES FOR COCOA

A current Cocoa Board circular indicates to dealers how they might calculate the wet bean price they pay, given the dry bean price on offer in the market. It states, from a dry bean price of, say, K1500 per tonne, deduct processing cost (e.g. of K250 per tonne) and profit (say, K200 per tonne), leaving the amount available to pay for wet bean. Taking account of bulk reduction, to produce one tonne or 1,000 kilograms of dry bean requires 2,500 kilograms of wet bean. Hence the wet bean price per kilogram is -

$$\frac{K1050}{2500} = K0.42 \text{ or } 42 \text{ toea per kilogram}$$

This gives the general formula

$$\frac{D - (C + P)}{2500} = W \text{ or}$$

$$D = 2500 W + C + P$$

$$P = D - 2500 W - C$$

The trader is expected to insert the values of C and P he or she feels are appropriate.

In our own analysis we are concerned only with the trader's margin, the difference between the price received for dry bean and the price paid out, including payment for processing. No use is made of any assumption regarding profit rate. To find the dry bean equivalent price for a given wet bean price we find the amount paid out to obtain one tonne (1000 kilograms) of dry bean. This is the payment for the wet bean required and the cost of turning this into dry bean. The equivalent dry bean price is therefore -

$$D = 2500 W + C$$

If $W = 40 \text{ toea/kg or } 0.40 \text{ kina/kg.}$, we have

$$\begin{aligned} D &= 2500 (.40) + 250 \\ &= 1250 \text{ (kina/tonne).} \end{aligned}$$

Similarly for any value of W, yielding :

Wet bean price (t/kg)	Equivalent dry bean price (k/tonne)	Wet bean price (t/kg)	Equivalent dry bean price (k/tonne)
40	1250	48	1450
41	1275	49	1475
42	1300	50	1500
43	1325	51	1525
44	1350	52	1550
45	1375	53	1575
46	1400	54	1600
47	1425	55	1625

In our calculations we have adopted both the figure of K250 per tonne for processing costs and the conversion ratio of 2500 : 1000 for wet bean to dry bean as above. The figure of K250 may be very inexact : this will not affect the regression analysis of the association between variables so long as it can be assumed constant. On the whole it is reasonable to assume this over a three year period, given the relatively stable Papua New Guinea currency.

The conversion ratio of 2500 : 1000 may be queried also. One trader used 2680 : 1000, taking into account adulteration of produce through mixing in of stones, immature bean, and weighting of wet bean with water. As shown in the table, values of dry bean in kina/tonne increase by a constant K25 for every toea of wet bean price. The increase with the higher ratio would be K26.8, but would again be constant for every toea increase in wet bean price.

Table A.1
Rabaul main dealer average wet bean price and local fermentary
prices in the area of Gaulim¹, April-December 1987

Work Day	Day	Dealer's prices	Local fermentary prices ²					Divergence from dealer's price				
		East New Britain	F1	F2	Gaulim F3	Other F4	F5	F1	F2	F3	F4	F5
April												
1	1	47		45					2			
2	2	47	45	45				2	2			
3	3	47	45	45	46.8			2	2	0.2		
4	6	47	45	45				2	2			
5	7	47	45	45	46.7			2	2	0.3		
6	8	47	45	45				2	2			
7	9	47	45	45				2	2			
8	10	47	45	45				2	2			
9	13	48	45	45				3	3			
10	14	48	45	45				3	3			
11	15	48	45	45				3	3			
12	16	48	45	45				3	3			
13	21	48	45	45				3	3			
14	22	48	45	45				3	3			
15	23	48	45	45				3	3			
16	24	48	45	45				3	3			
17	27	48	45	45				3	3			
18	28	48	45	45	46.9			3	3	1.1		
19	29	48	45	45				3	3			
20	30	48	45	45				3	3			
May												
1	1	48	45	45				3	3			
2	4	47	45	45				2	2			
3	5	47	45	45				2	2			
4	6	47	45	45	45.4			2	2	1.6		
5	7	47	45	45	48.3			2	2	-1.3		
6	8	48	45	45	48.5			3	3	-0.5		
7	11	48	40	40	47.1			8	8	0.9		
8	12	48	40	40	47.3			8	8	0.7		
9	13	48	40	40	48.6			8	8	-0.6		
10	14	48	40	40	48.6			8	8	-0.6		
11	15	48	40	40	44.6	39.0		8	8	3.4	9.0	
12	18	47	40	40	49.3	40.7		7	7	-2.3	6.3	
13	18	47	40	40				7	7			
14	19	47	40	40				7	7			
15	22	47	40	40				7	7			
16	23	47	40	40				7	7			
17	24	47	40	40				7	7			
18	25	47	40	40				7	7			
19	26	47	40	40				7	7			
20	29	47	40	40				7	7			
21	30	47	40	40				7	7			

Table A.1 continued

Work Day	Day	Dealer's prices	Local fermentary prices ²					Divergence from dealer's price				
		East New Britain	F1	F2	Gaulim F3	F4	Other F5	F1	F2	F3	F4	F5
June												
1	1	47	40	40			46	7	7			1
2	2	47	40	40			46	7	7			1
3	3	47	40	40		39.2	46	7	7		7.8	1
4	6	47	40	40			46	7	7			1
5	7	47	40	40			46	7	7			1
6	8	47	40	45		36.1	46	7	2		10.9	1
7	9	46	40	40			46	6	6			0
8	10	46	40	40			46	6	6			0
9	14	46	40	40			46	6	6			0
10	15	46	40	40			46	6	6			0
11	16	46	40	40			46	6	6			0
12	17	46	40	40			46	6	6			0
13	20	46	40	40			46	6	6			0
14	21	46	40	40			46	6	6			0
15	22	46	40	40			46	6	6			0
16	24	46	40	40			46	6	6			0
17	26	46	45	45			46	1	1			0
18	27	46	40	40			46	6	6			0
19	28	46	40	40			46	6	6			0
20	29	46	40	40			46	6	6			0
21	30	46	40	40			46	6	6			0
July												
1	1	46	40	40			46	6	6			0
2	2	46	40	40			46	6	6			0
3	3	46	40	40		39.9	46	6	6		6.1	0
4	6	46	40	40		38.4	46	6	6		7.6	0
5	7	46	40	40		35.2	46	6	6		10.8	0
6	8	46	40	40			46	6	6			0
7	9	46	40	40		38.6	46	6	6		7.4	0
8	10	46	40	40		37.9	46	6	6		8.1	0
9	14	46	45	40			46	1	6			0
10	15	46	45	45			46	1	1			0
11	16	46	45	45			46	1	1			0
12	17	46	45	45			46	1	1			0
13	20	46	45	45			46	1	1			0
14	21	46	45	45			46	1	1			0
15	22	46	45	45			46	1	1			0
16	24	46	45	45			46	1	1			0
17	27	46	45	45			46	1	1			0
18	28	46	45	45			46	1	1			0
19	29	46	45	45			46	1	1			0
20	30	46	45	45			46	1	1			0
21	31	46	45	45			46	1	1			0

Table A.1 continued

Work Day	Day	Dealer's prices	Local fermentary prices ²					Divergence from dealer's price				
		East New Britain	F1	F2	Gaulim F3	Other F4	F5	F1	F2	F3	F4	F5
August												
1	3	46	45	45		46		1	1			0
2	4	46	45	45		46		1	1			0
3	5	46	45	45		46		1	1			0
4	6	46	45	45		46		1	1			0
5	7	46	45	45		36.8	46	1	1		9.2	0
6	10	46	45	45		38.3	46	1	1		7.7	0
7	11	46	45	45		36.9	46	1	1		9.1	0
8	12	46	45	45		46		1	1			0
9	13	46	45	45		46		1	1			0
10	14	46	45	45		46		1	1			0
11	17	46	45	45		46		1	1			0
12	18	46	45	45		46		1	1			0
13	19	46	45	45		46		1	1			0
14	20	46	45	45		46		1	1			0
15	21	46	45	45		46		1	1			0
16	24	46	45	45		45		1	1			1
17	25	46	45	45		45		1	1			1
18	26	46	45	45		45		1	1			1
19	27	46	45	45		45		1	1			1
20	28	46	45	45		36.3	45	1	1		9.7	1
21	31	46	45	45		45		1	1			1
September												
1	1	46	45	45		35.2	45	1	1		10.8	1
2	2	46	45	45		45		1	1			1
3	3	46	45	45		35.3	45	1	1		10.7	1
4	4	46	45	45		37.2	45	1	1		8.8	1
5	7	46	45	45		35.0	45	1	1		11.0	1
6	8	46	45	45		45		1	1			1
7	9	46	45	45		45		1	1			1
8	10	46	45	45		38.3	45	1	1		7.7	1
9	11	46	45	45		45		1	1			1
10	14	46	45	45		45		1	1			1
11	15	46	45	45		45		1	1			1
12	17	46	45	45		35.8	45	1	1		10.2	1
13	18	46	45	45		45		1	1			1
14	21	45	45	45		46		1	1			0
15	22	45	45	45		46		1	1			0
16	23	46	45	45		46		1	1			0
17	24	46	45	45		46		1	1			0
18	25	46	45	45		42		1	1			4
19	28	46	45	45		45		1	1			1
20	29	46	45	45		45		1	1			1
21	30	46	45	45		45		1	1			1

Table A.1 continued

Work Day	Day	Dealer's prices	Local fermentary prices ²					Divergence from dealer's price				
		East New Britain	F1	F2	Gaulim F3	Other F4	F5	F1	F2	F3	F4	F5
October												
1	1	46	45	45		39.3	45	1	1		6.7	1
2	2	46	45	45		37.8	45	1	1		8.2	1
3	5	45	45	45		38.6	45	0	0		6.4	0
4	6	45	45	45			45	0	0			0
5	7	46	45	45		38.5	45	1	1		7.5	1
6	8	46	45	45		37.5	45	1	1		8.5	1
7	9	45	45	45		39.5	45	0	0		5.5	0
8	12	45	45	45			45	0	0			0
9	13	45	45	45		39.1	45	0	0		5.9	0
10	14	45	40	45		37.6	45	5	0		7.4	0
11	15	45	40	40		38.3	45	5	5		6.7	0
12	16	45	40	40		38.8	45	5	5		6.2	0
13	19	45	40	40		39.4	45	5	5		5.6	0
14	20	45	40	40		37.5	45	5	5		7.5	0
15	21	45	40	40		39.1	45	5	5		5.9	0
16	22	45	40	40			45	5	5			0
17	23	45	40	40		38.2	45	5	5		6.8	0
18	20	46	40	40			45	6	6			1
19	27	46	40	40		37.3	45	6	6		8.7	1
20	28	46	40	40		38.2	45	6	6		7.8	1
21	29	46	40	40		39.6	45	6	6		6.4	1
22	30	46	40	40			45	6	6			1
November												
1	2	46	45	40			45	1	6			1
2	3	46	45	40		38.4	45	1	6		7.6	1
3	4	46	45	40		38.9	45	1	6		7.1	1
4	5	46	45	40			45	1	6			1
5	6	46	45	40		39.0	45	1	6		7.0	1
6	9	46	45	40		38.5	45	1	6		7.5	1
7	10	46	45	40		38.6	45	1	6		7.4	1
8	11	46	45	40	43.7	38.2	45	1	6	2.3	7.8	1
9	12	46	45	40	40.7	37.3	45	1	6	5.3	8.7	1
10	13	46	45	40	41.5	38.5	45	1	6	4.5	7.5	1
11	16	46	45	40	41.6		45	1	6	4.4		1
12	17	46	45	40	41.3		45	1	6	4.7		1
13	18	46	45	40	41.4		45	1	6	4.6		1
14	19	46	45	40	41.5		45	1	6	4.5		1
15	20	46	45	40	43.4		45	1	6	2.6		1
16	23	46	45	40	40.6		45	1	6	5.4		1
17	24	46	45	40			45	1	6			1
18	25	46	45	40	43.7		45	1	6	2.3		1
19	26	46	45	40	42.8		45	1	6	3.2		1
20	27	46	45	40	41.4		45	1	6	4.6		1
21	30	46	45	40	44.5		45	1	6	1.5		1

Table A.1 continued

Work Day	Day	Dealer's prices		Local fermentary prices ²					Divergence from dealer's price				
		East New Britain	F1 F2	Gaulim F3 F4	Other F5	F1 F2	F3 F4	F5					
December													
1	1	46	45 40	48.8		45	1 6	-2.8					
2	2	46	45 45	50.2		45	1 1	-4.2					
3	3	46	45 45	46.8		45	1 1	-0.8					
4	4	46	45 45	46.5		45	1 1	-0.5					
5	7	46	45 45	47.2	37.4	45	1 1	-1.2	8.6				
6	8	46	45 45	46.5	37.9	45	1 1	-0.5	8.1				
7	9	46	45 45	48.3		45	1 1	-2.3					
8	10	46	45 45	45.8	37.8	45	1 1	0.2	8.2				
9	11	46	45 45	48.0	36.4	45	1 1	-2.0	9.6				
10	14	46	45 45	45.3	37.5	45	1 1	0.7	8.5				
11	15	46	45 45	46.9	38.4	45	1 1	-0.9	7.6				
12	16	46	45 45	44.5	37.5	45	1 1	1.5	8.5				
13	17	46	45 45	46.8		45	1 1	-0.8					
14	18	47	45 45			45	2 2						
15	21	47	45 45	50.0		45	2 2	-3.0					
16	22	46	45 45	50.0		45	1 1	-4.0					
17	23	47	45 45			45	2 2						
18	24	47	45 45	50.0		45	2 2	-3.0					
19	28	46	42 45	47.8		45	4 1	-1.8					
20	29	46	42 40			45	4 6						
21	30	46	42 40			45	4 6						
22	31	46	42 40			45	4 6						

Notes:

1. Fermentary 5 is not in Gaulim, but located nearer to Rabaul.
2. In the case of Fermentary 1 and Fermentary 2 prices refer to prices on offer : actual purchases may not have been made on each day listed.

Table A.2
Average prices received by exporters, f.o.b. for cocoa, paid by exporters
for cocoa delivered into store, inclusive of bounty, and paid by dealers
to growers in East New Britain, monthly averages, 1985-1987,
together with implied exporters' and dealers' margins

Month	F.o.b. export price without bounty (1)	Bounty (2)	F.o.b. export price incl. bounty (3)	Exporters' DIS price incl. bounty (4)	Dealers' equiv. dry bean price (5)	Exporters' margin (6)	Dealers' margin (7)
1985							
January	1838	304	2142	2018	1434	123	584
February	1986	240	2226	2118	1475	108	643
March	2029	96	2125	2006	1506	119	500
April	2169	80	2249	1935	1504	313	432
May	2091	64	2155	1927	1500	228	427
June	2065	112	2177	1933	1449	184	485
July	2008	128	2136	1983	1457	152	527
August	1966	112	2078	1992	1468	96	524
September	2047	96	2143	2041	1475	102	566
October	2118	64	2182	1962	1476	220	486
November	2107	96	2203	2017	1475	186	542
December	2102	80	2182	2106	1510	76	596
1986							
January	2145	160	2305	2158	1525	147	633
February	2115	176	2291	2016	1518	276	498
March	1922	256	2178	1981	1467	197	514
April	1831	336	2167	1859	1389	309	469
May	1634	448	2082	1835	1375	247	460
June	1442	512	1954	1924	1354	30	570
July	1626	512	2138	2082	1399	56	683
August	1725	416	2141	2087	1413	54	674
September	1813	368	2181	2167	1425	13	742
October	1811	304	2115	1970	1429	144	541
November	1810	368	2178	1983	1448	195	535
December	1646	400	2046	1954	1425	142	529
1987							
January	1660	448	2108	1946	1425	159	521
February	1618	480	2098	1930	1425	168	505
March	1636	496	2132	1952	1425	180	527
April	1649	480	2129	1935	1440	193	495
May	1617	496	2113	1970	1433	144	536
June	1577	480	2057	1892	1407	165	485
July	1642	512	2154	2033	1400	121	633
August	1648	464	2112	1906	1400	206	506
September	1560	496	2056	1860	1400	196	460
October	1544	544	2088	1854	1385	234	469
November	1498	576	2074	1922	1400	152	522
December	1391	544	1935	1840	1405	96	435

Source: Derived from Table A.3.

Table A.3
Average prices received by exporters, f.o.b. for cocoa, paid by exporters for cocoa delivered into store, inclusive of bounty, and paid by dealers to growers in East New Britain, on a daily basis, period 1985-1987

Work Day	Date	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
1985						
January	(Bounty = K 304)					
	1	1809.0				
1	2	1809.0	2113	1915	47	1425
2	3	1811.0	2115	1892	47	1425
3	4		2115	1900	47	1425
	5					
	6					
4	7		2115	1900	47	1425
5	8	1812.0	2116	1913	47	1425
6	9		2116	1933	47	1425
7	10	1831.0	2135	1942	47	1425
8	11		2135	1945	48	1450
	12					
	13					
9	14		2135	1999	47	1425
10	15		2135	2044	47	1425
11	16		2135	2007	47	1425
12	17		2135	2029	47	1425
13	18	1849.0	2153	2057	47	1425
	19					
	20					
14	21		2153	2060	47	1425
15	22		2153	2080	47	1425
16	23		2153	2075	47	1425
17	24	1855.0	2159	2078	47	1425
18	25	1851.0	2155	2060	47	1425
	26					
	27					
19	28		2155	2104	48	1450
20	29		2155	2119	48	1450
21	30	1873.0	2177	2177	48	1450
22	31	1898.0	2202	2177	48	1450

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
February		(Bounty = K240)				
1	1	1898.0	2138	2113	48	1450
	2					
	3					
2	4		2138	2130	48	1450
3	5	1909.0	2149	2165	48	1450
4	6		2149	2120	48	1450
5	7	1904.0	2145	2140	48	1450
6	8		2145	2153	50	1500
	9					
	10					
7	11		2145	2175	49	1475
8	12	2041.0	2281	2063	49	1475
9	13	2032.0	2272	2068	49	1475
10	14		2272	2095	49	1475
11	15		2272	2088	49	1475
	16					
	17					
12	18	2024.0	2264	2065	49	1475
13	19		2264	2070	49	1475
14	20		2264	2063	49	1475
15	21		2264	2123	50	1500
16	22		2264	2128	50	1500
	23					
	24					
17	25	2031.0	2271	2108	50	1500
18	26		2271	2188	49	1475
19	27		2271	2143	49	1475
20	28		2271	2155	50	1500
March		(Bounty = K96)				
1	1	1998.0	2094	2016	50	1500
	2					
	3					
2	4		2094	2011	50	1500
3	5	2094	2001	50	1500	
4	6		2094	1922	50	1500
5	7	1945.0	2041	1889	49	1475
6	8	1905.0	2001	1929	49	1475
	9					
	10					
7	11		2001	1951	50	1500
8	12	1991.0	2087	1991	50	1500

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
9	13		2087	1966		
10	14		2087	2041	50	1500
11	15	2004.0	2100	1979	50	1500
	16				50	1500
	17					
12	18		2100	1989	50	1500
13	19	2016.0	2112	2054	50	1500
14	20	2027.0	2123	2059	50	1500
15	21		2123	2094	51	1525
16	22	2113.0	2209	2021	51	1525
	23					
	24					
17	25		2209	2034	51	1525
18	26	2146.0	2242	2049	51	1525
19	27		2242	2035	51	1525
20	28		2242	2036	51	1525
21	29	2144.0	2240	2064	51	1525
	30					
	31					
April	(Bounty = K 80)					
1	1	2165.0	2245	2048	51	1525
2	2	2150.0	2230	1998	51	1525
3	3	2206.0	2286	2006	51	1525
4	4		2286	2006	51	1525
	5					
	6					
	7					
	8					
5	9	2228.0	2308	2021	51	1525
6	10	2209.0	2309	2025	51	1525
7	11		2309	1988	51	1525
8	12	2113.0	2193	1993	51	1525
	13					
	14					
9	15	2171.0	2251	2023	49	1475
10	16	2189.0	2269	2025	49	1475
11	17	2122.0	2202	2015	49	1475
12	18	2099.0	2179	2083	49	1475
13	19		2179	2124	49	1475
	20					
	21					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
14	22	2117.0	2197	2103	50	1500
15	23	2195.0	2275	2108	50	1500
16	24		2275	2070	50	1500
17	25		2275	2033	50	1500
18	26	2151.0	2231	2005	50	1500
	27					
	28					
19	29	2155.0	2235	2005	50	1500
20	30	2160.0	2240	2028	50	1500
May (Bounty = K64)						
1	1	2174.0	2238	1962	50	1500
2	2	2112.0	2176	1968	50	1500
3	3		2176	1975	50	1500
	4					
	5					
4	6		2176	1959	50	1500
5	7		2176	1935	50	1500
6	8		2176	1955	50	1500
7	9		2176	1931	50	1500
8	10	2088.0	2152	1944	50	1500
	11					
	12					
9	13	2090.0	2154	1985	50	1500
10	14	2085.0	2149	1992	50	1500
11	15	2099.0	2163	1977	50	1500
12	26	2102.0	2166	1944	50	1500
13	17		2166	1857	50	1500
	18					
	19					
14	20	2098.0	2162	1869	50	1500
15	21		2162	1894	50	1500
16	22	2063.0	2127	1899	50	1500
17	23		2127	1902	50	1500
18	24	2045.0	2109	1899	50	1500
	25					
	26					
19	27	2056.0	2120	1902	50	1500
20	28		2120	1846	50	1500
21	29	2064.0	2128	1912	50	1500
22	30		2128	1919	50	1500
23	31	2071.0	2135	1884	50	1500

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
June (Bounty = K112)						
	1					
	2					
1	3	2036.0	2148	1955	49	1475
2	4		2148	1950	48	1450
3	5		2148	1935	49	1475
4	6	1964.0	2076	1941	49	1475
5	7		2076	1941	49	1475
	8					
	9					
	10					
6	11	1984.0	2096	1968	47	1425
7	12		2096	1986	47	1425
8	13		2096	1904	47	1425
9	14	1990.0	2102	1907	47	1425
	15					
	16					
10	17	1974.0	2086	1912	47	1425
11	18	2028.0	2140	1931	47	1425
12	19	2019.0	2131	1937	47	1425
13	20		2131	1940	47	1425
14	21	2018.0	2130	1960	47	1425
	22					
	23					
15	24	2031.0	2143	1902	48	1450
16	25		2143	1905	48	1450
17	26	2011.0	2123	1900	48	1450
18	27		2123	1927	48	1450
19	28	1978.0	2090	1932	48	1450
	29					
	30					
July (Bounty = K128)						
1	1	1978.0	2106	1946	48	1450
2	2		2106	1939	48	1450
3	3		2106	1944	48	1450
4	4	1991.0	2119	2016	48	1450
5	5		2119	2021	48	1450
	6					
	7					
6	8	2009.0	2137	2032	48	1450
7	9	2023.0	2151	2044	48	1450

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
8	10		2151	2031	48	1450
9	11	2015.0	2143	2032	48	1450
10	12		2143	2037	48	1450
	13					
	14					
11	15	2012.0	2140	1960	48	1450
12	16	2014.0	2142	1970	49	1475
13	17		2142	2019	48	1450
14	18		2142	1967	48	1450
15	19	2012.0	2140	1935	48	1450
	20					
	21					
16	22	2008.0	2136	1948	48	1450
	23					
17	24		2136	1964	48	1450
18	25	2021.0	2149	1976	49	1475
19	26		2149	1986	49	1475
	27					
	28					
20	29		2149	1983	49	1475
21	30		2149	1941	49	1475
22	31	2004.0	2132	1943	49	1475
August (Bounty = K112)						
1	1	2004.0	2116	1932	48	1450
2	2		2116	1947	49	1475
	3					
	4					
3	5	1959.0	2071	1937	49	1475
4	6		2071	1960	49	1475
5	7	1936.0	2048	1970	49	1475
6	8		2048	1957	49	1475
7	9	1951.0	2063	1966	49	1475
	10					
	11					
8	12		2063	1976	49	1475
9	13	1923.0	2035	1986	49	1475
10	14		2035	1982	49	1475
11	15		2035	1977	49	1475
12	16	1936.0	2048	1991	49	1475
	17					
	18					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
13	19	1979.0	2091	1977	49	1475
14	20	1942.0	2054	1981	49	1475
15	21	1917.0	2029	1980	49	1475
16	22	1964.0	2076	1990	49	1475
17	23		2076	2042	49	1475
	24					
	25					
18	26	1995.0	2107	2042	48	1450
19	27	2012.0	2124	2042	48	1450
20	28		2124	2082	48	1450
21	29	2031.0	2143	2082	48	1450
22	30		2143	2020	48	1450
	31					
September (Bounty = K96)						
	1					
1	2	2025.0	2121	2024	49	1475
2	3	2000.0	2096	2024	49	1475
3	4		2096	2040	49	1475
4	5	1995.0	2091	2056	49	1475
5	6	2021.0	2117	2075	49	1475
	7					
	8					
6	9	1995.0	2091	1986	49	1475
7	10		2091	1981	49	1475
8	11	1978.0	2074	1984	49	1475
9	12	1991.0	2087	2009	49	1475
	13					
	14					
	15					
	16					
	17					
10	18	1985.0	2087	2047	48	1450
11	19	2010.0	2106	2036	49	1475
12	20		2106	2056	49	1475
	21					
	22					
13	23	2107.0	2203	2095	49	1475
14	24	2147.0	2243	2070	49	1475
15	25		2243	2064	49	1475
16	26		2243	2071	49	1475
17	27		2243	2061	49	1475
	28					
	29					
18	30		2243	2065	49	1475

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
October (Bounty = K 64)						
1	1	2147.0	2211	2034	49	1475
2	2	2136.0	2200	1987	49	1475
3	3	2133.0	2197	1979	49	1475
4	4	2140.0	2904	1983	50	1500
	5					
	6					
5	7		2204	1994	49	1475
6	8	2156.0	2220	2035	49	1475
7	9	2096.0	2160	2022	49	1475
8	10	2128.0	2192	2009	49	1475
9	11	2123.0	2187	1929	49	1465
	12					
	13					
10	14	2121.0	2185	1947	49	1475
11	15	2118.0	2182	1879	49	1475
12	16	2117.0	2181	1894	49	1475
13	17		2181	1937	49	1475
14	18	2112.0	2176	1969	49	1475
	19					
	20					
15	21		2176	1959	49	1475
16	22	2090.0	2154	1964	49	1475
17	23		2154	1962	49	1475
18	24	2093.0	2157	1959	49	1475
19	25	2091.0	2155	1963	49	1475
	26					
	27					
20	28	2095.0	2159	1968	49	1475
21	29	2119.0	2183	1967	49	1475
22	30		2183	1892	49	1475
23	31	2114.0	2178	1892	49	1475
November (Bounty = K 96)						
1	1	2114.0	2210	1939	49	1475
	2					
	3					
2	4		2210	1941	49	1475
3	5	2110.0	2206	1962	49	1475
4	6	2112.0	2208	1932	49	1475
5	7		2208	1936	49	1475
6	8		2208	1981	49	1475
	9					
	10					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
7	11	2095.0	2191	1991	49	1475
8	12	2082.0	2178	2006	49	1475
9	13		2178	2024	49	1475
10	14	2103.0	2199	2019	49	1475
11	15		2199	2009	49	1475
	16					
	17					
12	18		2199	2042	49	1475
13	19	2133.0	2229	2044	49	1475
14	20	2125.0	2221	2041	49	1475
15	21		2221	2052	49	1475
16	22		2221	2079	49	1475
	23					
	24					
17	25	2100.0	2196	2091	49	1475
18	26		2196	2089	49	1475
19	27	2115.0	2211	2079	49	1475
20	28	2115.0	2211	2055	49	1475
21	29	2076.0	2172	2055	49	1475
	30					
December (Bounty = K80)						
	1					
1	2	2072.0	2152	2063	49	1475
2	3		2152	2071	49	1475
3	4		2152	2061	50	1500
4	5		2152	2063	50	1500
5	6	2106.0	2186	2053	50	1500
	7					
	8					
6	9	2017.0	2097	2103	50	1500
7	10	2093.0	2173	2105	50	1500
8	11	2119.0	2189	2088	50	1500
9	12	2125.0	2205	2078	50	1500
10	13		2205	2088	50	1500
	14					
	15					
11	16		2205	2080	51	1525
12	17	2097.0	2177	2085	51	1525
13	18	2096.0	2176	2108	51	1525
14	19	2102.0	2182	2100	51	1525
15	20	2097.0	2177	2103	51	1525
	21					
	22					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
16	23	2115.0	2195	2145	51	1525
17	24	2120.0	2200	2173	51	1525
	25					
	26					
18	27	2130.0	2210	2173	51	1525
	28					
	29					
19	30	2141.0	2221	2190	51	1525
20	31	2145.0	2225	2184	51	1525
1986						
January (Bounty = K160)						
	1	2125.0				
1	2		2285	2264	51	1525
2	3		2285	2298	51	1525
	4					
	5					
3	6		2285	2240	51	1525
4	7		2285	2173	51	1525
5	8	2181.0	2341	2163	51	1525
6	9	2127.0	2287	2143	51	1525
7	10		2287	2183	51	1525
	11					
	12					
8	13	2103.0	2263	2200	51	1525
9	14		2263	2176	51	1525
10	15		2263	2181	51	1525
11	16	2146.09	2306	2161	51	1525
12	17	2147.0	2307	2148	51	1525
	18					
	19					
13	20		2307	2123	51	1525
14	21	2124.0	2284	2116	51	1525
15	22	2209.0	2369	2117	51	1525
16	23		2369	2118	51	1525
17	24	2201.0	2361	2121	51	1525
	25					
	26					
18	27		2361	2124	51	1525
19	28		2361	2117	51	1525
20	29	2208.0	2368	2111	51	1525
21	30	2080.0	2240	2110	51	1525
22	31	2083.0	2243	2098	51	1525

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
February (Bounty = K176)						
	1	2083.0				
	2					
1	3	2082.0	2258	2107	51	1525
2	4	2180.0	2356	2106	51	1525
3	5		2356	2056	51	1525
4	6		2356	2054	51	1525
5	7		2356	2062	51	1525
	8					
	9					
6	10		2356	2011	51	1525
7	11	2169.0	2345	2021	51	1525
8	12		2345	2029	51	1525
9	13		2345	2020	51	1525
10	14		2345	2014	51	1525
	15					
	16					
11	17		2345	2016	51	1525
12	18	2133.0	2309	2019	51	1525
13	19	2115.0	2291	2031	51	1525
14	20	2119.0	2295	2000	51	1525
15	21	2136.0	2312	1980	50	1500
	22					
	23					
16	24	1998.0	2174	1980	50	1500
17	25		2174	1997	50	1500
18	26		2174	1982	50	1500
19	27		2174	1907	50	1500
20	28	1982.0	2158	1921	50	1500
March (Bounty = K256)						
	1					
	2					
1	3	1965.0	2221	1967	50	1500
2	4		2221	2020	50	1500
3	5		2221	1961	49	1475
4	6		2221	1926	49	1475
5	7		2221	1971	49	1475
	8					
	9					
6	10	1951.0	2207	1989	49	1475
7	11		2207	1989	49	1475
8	12		2207	2035	49	1475

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
9	13	1893.0	2149	2031	49	1475
10	14		2149	2052	48	1450
	15					
	16					
11	17		2149	2021	48	1450
12	18		2149	2037	48	1450
13	19		2149	2047	48	1450
14	20	1892.0	2148	2027	48	1450
15	21		2148	1996	48	1450
	22					
	23					
16	24		2148	1915	48	1450
17	25		2148	1872	48	1450
18	26		2148	1875	49	1475
19	27	1920.0	2176	1879	49	1475
	28					
	29					
	30					
	31					
April (Bounty = K 336)						
1	1	1891.0	2227	1905	49	1475
2	2		2227	1896	47	1425
3	3		2227	1905	47	1425
4	4	1845.0	2181	1890	47	1425
	5					
	6					
5	7		2181	1879	45	1375
6	8		2181	1866	45	1375
7	9	1808.0	2144	1864	45	1375
8	10		2144	1567	45	1375
9	11		2144	1871	45	1375
	12					
	13					
10	14	1978.0	2314	1841	45	1375
11	15		2314	1821	45	1375
12	16	1947.0	2283	1817	45	1375
13	17		2283	1820	45	1375
14	18	1682.0	2018	1939	45	1375
	19					
	20					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
15	21		2018	1909	46	1400
16	22	1737.0	2073	1961	46	1400
17	23	1847.0	2183	1951	45	1375
18	24		2183	1904	45	1375
19	25		2183	1809	45	1375
	26					
	27					
20	28	1775.0	2111	1737	45	1375
21	29	1692.0	2028	1711	45	1375
22	30		2029	1722	45	1375
May (Bounty = K 448)						
1	1	1671.0	2119	1829	45	1375
2	2		2119	1851	45	1375
	3					
	4					
3	5		2119	1836	45	1375
4	6		2119	1838	45	1375
5	7		2119	1788	45	1375
6	8		2119	1791	45	1375
7	9		2119	1824	45	1375
	10					
	11					
8	12	1660.0	2108	1823	45	1375
9	13	1609.0	2057	1861	45	1375
10	14	1625.0	2073	1819	45	1375
11	15		2073	1809	45	1375
12	16		2073	1844	45	1375
	17					
	18					
13	19	1621.0	2069	1848	45	1375
14	20		2069	1829	45	1375
15	21		2069	1842	45	1375
16	22		2069	1850	45	1375
17	23	1630.0	2078	1835	45	1375
	24					
	25					
18	26		2078	1847	45	1375
19	27		2078	1847	45	1375
20	28	1584.0	2032	1862	45	1375
21	29		2031	1862	45	1375
22	30	1571.0	2019	1845	45	1375
	31					

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
June (Bounty = K512)						
	1					
1	2	1594.0	2106	1899	44	1350
2	3		2106	1893	44	1350
3	4		2106	1890	44	1350
4	5		2106	1933	44	1350
5	6	1575.0	2087	1999	44	1350
	7					
	8					
	9					
6	10		2087	1944	45	1375
7	11	1601.0	2118	1944	45	1375
8	12	1591.0	2103	1934	45	1375
9	13	1585.0	2097	1954	44	1350
	14					
	15					
10	16	1697.0	2209	1939	44	1350
11	17	1703.0	2215	1895	44	1350
12	18	1695.0	2207	1902	44	1350
13	19	1691.0	2203	1881	44	1350
14	20		2203	1942	44	1350
	21					
	22					
15	23		2203	1932	44	1350
16	24	1676.0	2188	1930	44	1350
17	25	1671.0	2183	1891	44	1350
18	26		2183	1908	44	1350
19	27		2183	1937	44	1350
	28					
	29					
20	30		2183	1923	44	1350
July (Bounty = K512)						
1	1	1674.0	2186	1945	44	1350
2	2		2186	1939	44	1350
3	3		2186	1939	44	1350
4	4	1553.0	2065	1934	44	1350
	5					
	6					
5	7		2065	1945	44	1350
6	8	1563.0	2075	2022	46	1400
7	9		2075	2028	46	1400
8	10		2075	2028	46	1400

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
9	11	1582.0	2094	2043	46	1400
	12					
	13					
	14					
10	15		2094	2085	46	1400
11	16		2094	2091	46	1400
12	17		2094	2095	46	1400
13	18	1604.0	2116	2120	47	1425
	19					
	20					
14	21	1678.0	2190	2187	47	1425
15	22		2190	2211	47	1425
	23					
16	24		2190	2164	47	1425
17	25		2190	2182	47	1425
	26					
	27					
18	28	1667.0	2179	2174	47	1425
19	29		2179	2183	47	1425
20	30	1680.0	2192	2196	47	1425
21	31		2192	2205	47	1425
August (Bounty = K416)						
1	1	1680.0	2096	2099	47	1425
	2					
	3					
2	4		2096	2102	47	1425
3	5		2096	2068	47	1425
4	6		2096	2060	47	1425
5	7	1688.0	2104	2075	46	1400
6	8	1718.0	2134	2095	46	1400
	9					
	10					
7	11		2134	2051	46	1400
8	12		2134	2060	46	1400
9	13		2134	2163	46	1400
10	14		2134	2163	46	1400
11	15		2134	2075	46	1400
	16					
	17					
12	18	1760.0	2176	2079	47	1425
13	19		2176	2077	47	1425

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
14	20		2176	2081	47	1425
15	21	1744.0	2160	2085	47	1425
16	22		2160	2079	46	1400
	23					
	24					
17	25		2160	2079	46	1400
18	26		2160	2099	46	1400
19	27		2160	2121	47	1425
20	28	1756.0	2172	2131	47	1425
21	29		2172	2184	47	1425
	30					
	31					
September (Bounty = K368)						
1	1	1756.0	2124	2205	47	1425
2	2	1738.0	2106	2190	47	1425
3	3	1778.0	2146	2228	47	1425
4	4		2146	2208	47	1425
5	5		2146	2208	47	1425
	6					
	7					
6	8		2146	2206	47	1425
7	9		2146	2193	47	1425
8	10		2146	2178	47	1425
9	11	1850.0	2218	2183	47	1425
10	12	1905.0	2173	2216	47	1425
	13					
	14					
11	15		2173	2244	47	1425
	16					
12	17		2173	2217	47	1425
13	18	1835.0	2203	2198	47	1425
14	19		2203	2192	47	1425
	20					
	21					
15	22		2203	2216	47	1425
16	23		2203	2104	47	1425
17	24		2203	2061	47	1425
18	25		2203	2063	47	1425
19	26		2203	2069	47	1425
	27					
	28					
20	29	1898.0	2266	2073	47	1425
21	30		2266	2063	47	1425

Table A.3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
October (Bounty = K 304)						
1	1	1898.0	2202	1984	47	1425
2	2	1871.0	2175	1987	47	1425
3	3		2175	2020	47	1425
	4					
	5					
4	6		2175	2044	48	1450
5	7		2175	2038	48	1450
6	8		2175	1993	48	1450
7	9		2175	1967	48	1450
8	10	1867.0	2171	1935	47	1425
	11					
	12					
9	13	1803.0	2107	1945	47	1425
10	14		2107	1943	47	1425
11	15		2107	1956	47	1425
12	16	1803.0	2107	1974	47	1425
13	17		2107	1982	47	1425
	18					
	19					
14	20		2107	1992	47	1425
15	21	1736.0	2040	1967	47	1425
16	22		2040	1954	47	1425
17	23	1752.0	2056	1954	47	1425
18	24		2056	1964	47	1425
	25					
	26					
19	27		2056	1948	47	1425
20	28		2056	1943	47	1425
21	29	1763.0	2067	1948	47	1425
22	30	1797.0	2101	1945	47	1425
23	31		2101	1933	47	1425
November (Bounty = K 368)						
	1	1797.0				
	2					
1	3		2165	1961	48	1450
2	4		2165	1961	48	1450
3	5	1795.0	2163	1966	48	1450
4	6		2163	1974	48	1450
5	7	1839.0	2207	1974	48	1450
	8					
	9					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
6	10		2207	1967	48	1450
7	11		2207	1967	48	1450
8	12	1855.0	2223	2037	48	1450
9	13		2223	2047	48	1450
10	14	1799.0	2167	2041	48	1450
	15					
	16					
11	17	1783.0	2151	2047	48	1450
12	18	1786.0	2154	2012	48	1450
13	19		2154	1976	48	1450
14	20		2154	1998	48	1450
15	21		2154	1973	48	1450
	22					
	23					
16	24	1823.0	2191	1968	48	1450
17	25		2191	1949	48	1450
18	26		2191	1939	48	1450
19	27		2191	1946	47	1425
20	28	1763.0	2131	1946	47	1425
	29					
	30					
December (Bounty = K 400)						
1	1	1763.0	2163	1983	47	1425
2	2		2163	1951	47	1425
3	3	1739.0	2139	1951	47	1425
4	4		2139	1960	47	1425
5	5	1726.0	2126	1950	47	1425
	6					
	7					
6	8		2126	1949	47	1425
7	9		2126	1944	47	1425
8	10		2126	1936	47	1425
9	11	1759.0	2159	1958	47	1425
10	12		2159	1954	47	1425
	13					
	14					
11	15		2159	1944	47	1425
12	16		2159	1944	47	1425
13	17		2159	1946	47	1425
14	18		2159	1980	47	1425
15	19		2159	1943	47	1425
	20					
	21					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
16	22		2159	1973	47	1425
17	23		2159	1958	47	1425
18	24		2159	1953	47	1425
	25					
	26					
	27					
	28					
19	29	1719.0	2119	1953	47	1425
20	30		2119	1955	47	1425
21	31	1726.0	2126	1955	47	1425
1987						
January (Bounty = K448)						
	1	1726.0				
1	2	1719.5	2168	1976	47	1425
	3					
	4					
2	5		2168	2021	47	1425
3	6		2168	1971	47	1425
4	7	1686.0	2134	1948	47	1425
5	8		2134	1950	47	1425
6	9	1681.0	2129	1950	47	1425
	10					
	11					
7	12		2129	1948	47	1425
8	13	1643.8	2092	1948	47	1425
9	14		2092	1950	47	1425
10	15	1646.5	2095	1958	47	1425
11	16		2095	1958	47	1425
	17					
	18					
12	19		2095	1956	47	1425
13	20	1652.5	2101	1991	47	1425
14	21	1637.0	2085	1986	47	1425
15	22	1651.3	2099	1977	47	1425
16	23		2099	2012	47	1425
	24					
	25					
17	26	1641.3	2089	1883	47	1425
18	27	1634.3	2082	1876	47	1425
19	28		2082	1888	47	1425
20	29	1612.8	2061	1888	47	1425
21	30		2061	1886	47	1425

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
February (Bounty = K480)						
	1	1612.8				
1	2		2093	1930	47	1425
2	3		2093	1926	47	1425
3	4		2093	1931	47	1425
4	5		2093	1931	47	1425
5	6		2093	1933	47	1425
	7					
	8					
6	9		2093	1935	47	1425
7	10		2093	1968	47	1425
8	11	1624.0	2104	1938	47	1425
9	12		2104	1933	47	1425
10	13		2104	1908	47	1425
	14					
	15					
11	16		2104	1916	47	1425
12	17		2104	1921	47	1425
13	18	1618.5	2099	1921	47	1425
14	19		2099	1916	47	1425
15	20		2099	1925	47	1425
	21					
	22					
16	23		2099	1935	47	1425
17	24		2099	1928	47	1425
18	25		2099	1934	47	1425
19	26		2099	1938	47	1425
20	27		2099	1938	47	1425
	28					
March (Bounty = K496)						
	1	1618.5				
1	2	1619.8	2116	1952	47	1425
2	3	1625.3	2121	1948	47	1425
3	4		2121	1928	47	1425
4	5		2121	1947	47	1425
5	6	1623.3	2119	1947	47	1425
	7					
	8					
6	9		2119	1948	47	1425
7	10	1642.8	2139	1950	47	1425
8	11		2139	1946	47	1425

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
9	12		2139	1944	47	1425
10	13		2139	1945	47	1425
	14					
	15					
11	16		2139	1960	47	1425
12	17		2139	1982	47	1425
13	18	1641.3	2137	1959	47	1425
14	19		2137	1961	47	1425
15	20	1636.8	2133	1966	47	1425
	21					
	22					
16	23	1638.3	2134	1951	47	1425
17	24	1639.3	2135	1946	47	1425
18	25		2135	1949	47	1425
19	26		2135	1949	47	1425
20	27		2135	1936	47	1425
	28					
	29					
21	30		2135	1986	47	1425
22	31		2135	1951	47	1425
April (Bounty = K 480)						
1	1	1639.3	2119	1929	47	1425
2	2		2119	1930	47	1425
3	3	1643.8	2124	1928	47	1425
	4					
	5					
4	6		2124	1935	47	1425
5	7	1650.3	2130	1943	47	1425
6	8		2130	1909	47	1425
7	9	1667.8	2148	1929	47	1425
8	10		2148	1929	47	1425
	11					
	12					
9	13		2148	1929	48	1450
10	14		2148	1929	48	1450
11	15		2148	1908	48	1450
12	16	1651.5	2132	1908	48	1450
	17					
	18					
	19					
	20					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
13	21		2132	1955	48	1450
14	22		2132	1959	48	1450
15	23	1643.5	2124	1942	48	1450
16	24	1643.3	2123	1947	48	1450
	25					
	26					
17	27		2123	1954	48	1450
18	28	1628.3	2108	1947	48	1450
19	29		2108	1959	48	1450
20	30		2108	1938	48	1450
May (Bounty = K496)						
1	1	1628.3	2124	1954	48	1450
	2					
	3					
2	4		2124	1992	47	1425
3	5		2124	1993	47	1425
4	6		2124	1964	47	1425
5	7	1616.0	2112	1966	47	1425
6	8		2112	1989	48	1450
	9					
	10					
7	11		2112	1997	48	1450
8	12		2112	1985	48	1450
9	13		2112	1997	48	1450
10	14	1607.5	2104	1997	48	1450
11	15		2104	1998	48	1450
	16					
	17					
12	18	1612.3	2108	2004	47	1425
13	19		2108	1999	47	1425
14	20	1611.3	2107	1994	47	1425
15	21		2107	1971	47	1425
16	22		2107	1944	47	1425
	23					
	24					
17	25		2107	1953	47	1425
18	26	1623.8	2120	1941	47	1425
19	27	1629.8	2126	1931	47	1425
20	28	1614.3	2110	1895	47	1425
21	29	1616.8	2113	1895	47	1425
	30					
	31					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
June (Bounty = K480)						
1	1	1616.3	2096	1903	47	1425
2	2	1600.0	2080	1876	47	1425
3	3	1605.3	2085	1872	47	1425
4	4		2085	1891	47	1425
5	5		2085	1861	47	1425
	6					
	7					
	8					
6	9	1568.5	2049	1869	47	1425
7	10		2049	1870	46	1400
8	11		2049	1876	46	1400
9	12		2049	1876	46	1400
	13					
	14					
10	15	1563.8	2044	1843	46	1400
11	16	1571.8	2052	1861	46	1400
12	17		2052	1883	46	1400
13	18	1565.8	2046	1895	46	1400
14	19	1576.3	2056	1892	46	1400
	20					
	21					
15	22	1561.8	2042	1891	46	1400
16	23	1579.0	2059	1913	46	1400
17	24	1595.5	2076	1936	46	1400
18	25	1549.5	2030	1977	46	1400
19	26	1562.8	2043	1978	46	1400
	27					
	28					
20	29		2043	1985	46	1400
21	30	1537.0	2017	1980	46	1400
July (Bounty = K512)						
1	1	1537.0	2049	1994	46	1400
2	2		2049	1981	46	1400
3	3	1576.0	2088	2012	46	1400
	4					
	5					
4	6	1591.5	2104	2007	46	1400
5	7		2104	2017	46	1400
6	8		2104	2012	46	1400

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
7	9	1594.5	2107	2020	46	1400
8	10		2107	2022	46	1400
	11					
	12					
	13					
9	14	1604.5	2117	2079	46	1400
10	15	1616.8	2129	2087	46	1400
11	16		2129	2094	46	1400
12	17		2129	2108	46	1400
	18					
	19					
13	20	1663.0	2175	2100	46	1400
14	21	1684.0	2196	2076	46	1400
15	22		2196	2027	46	1400
	23					
16	24	1726.0	2238	2027	46	1400
	25					
	26					
17	27	1728.0	2240	2049	46	1400
18	28		2240	2037	46	1400
19	29		2240	1968	46	1400
20	30		2240	1983	46	1400
21	31	1746.0	2258	1997	46	1400
August (Bounty = K464)						
	1					
	2					
1	3	1717.0	2181	1943	4	1400
2	4		2181	1925	46	1400
3	5		2181	1916	46	1400
4	6		2181	1933	46	1400
5	7	1665.0	2129	1931	46	1400
	8					
	9					
6	10		2129	1892	46	1400
7	11	1626.0	2090	1884	46	1400
8	12		2090	1900	46	1400
9	13	1673.0	2137	1917	46	1400
10	14		2137	1891	46	1400
	15					
	16					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
11	17	1642.0	2106	1899	46	1400
12	18		2106	1899	46	1400
13	19		2106	1899	46	1400
14	20	1619.0	2083	1883	46	1400
15	21	1591.0	2055	1883	46	1400
	22					
	23					
16	24	1615.0	2079	1871	46	1400
17	25		2079	1900	46	1400
18	26		2079	1898	46	1400
19	27		2079	1923	46	1400
20	28		2079	1913	46	1400
	29					
	30					
21	31	1602.0	2066	1925	46	1400
September (Bounty = K496)						
1	1	1572.0	2068	1950	46	1400
2	2	1581.0	2077	1895	46	1400
3	3		2077	1906	46	1400
4	4	1559.0	2055	1896	46	1400
	5					
	6					
5	7		2055	1896	46	1400
6	8	1591.0	2087	1892	46	1400
7	9	1582.0	2078	1849	46	1400
8	10		2078	1828	46	1400
9	11		2078	1828	46	1400
	12					
	13					
10	14		2078	1819	46	1400
11	15	1581.0	2077	1819	46	1400
	16					
12	17		2077	1831	46	1400
13	18		2077	1831	46	1400
	19					
	20					
14	21		2077	1831	46	1400
15	22	1496.0	1992	1876	46	1400
16	23	1524.0	2020	1864	46	1400
17	24		2020	1856	46	1400
18	25		2020	1856	46	1400
	26					
	27					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) (4)	Dealers' equivalent dry bean price (K/tonne) (5)
19	28	1532.0	2028	1862	46	1400
20	29	1530.0	2026	1851	46	1400
21	30		2026	1827	46	1400
October (Bounty = K544)						
1	1	1530.0	2074	1842	46	1400
2	2	1553.0	2097	1847	46	1400
	3					
	4					
3	5		2097	1855	45	1375
4	6		2097	1845	45	1375
5	7		2097	1852	46	1400
6	8		2097	1879	46	1400
7	9		2097	1897	45	1375
	10					
	11					
8	12		2097	1893	45	1375
9	13		2097	1859	45	1375
10	14		2097	1857	45	1375
11	15	1555.0	2099	1844	45	1375
12	16		2099	1840	45	1375
	17					
	18					
13	19		2099	1817	45	1375
14	20		2099	1825	45	1375
15	21		2099	1847	45	1375
16	22		2099	1857	45	1375
17	23	1554.0	2098	1839	45	1375
	24					
	25					
18	26		2098	1832	46	1400
19	27		2098	1857	46	1400
20	28		2098	1868	46	1400
21	29	1526.0	2070	1868	46	1400
22	30	1491.0	2035	1866	46	1400
	31					
November (Bounty = K576)						
	1					
1	2	1491.0	2067	1923	46	1400
2	3		2067	1925	46	1400
3	4		2067	1930	46	1400
4	5		2067	1892	46	1400

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
5	6	1459.0	2035	1886	46	1400
	7					
	8					
6	9	1503.0	2079	1889	46	1400
7	10	1527.0	2103	1916	46	1400
8	11		2103	1965	46	1400
9	12		2103	1968	46	1400
10	13		2103	1958	46	1400
	14					
	15					
11	16		2103	1918	46	1400
12	17	1516.0	2092	1881	46	1400
13	18		2092	1874	46	1400
14	19		2092	1884	46	1400
15	20	1482.0	2058	1887	46	1400
	21					
	22					
16	23		2058	1892	46	1400
17	24	1478.0	2054	1934	46	1400
18	25		2054	1966	46	1400
19	26		2054	1961	46	1400
20	27		2054	1953	46	1400
	28					
	29					
21	30		2054	1963	46	1400
December (Bounty = K544)						
1	1	1540.0	2084	1914	46	1400
2	2		2084	1879	46	1400
3	3	1555.0	2099	1870	46	1400
4	4	1475.0	2019	1845	46	1400
	5					
	6					
5	7		2019	1905	46	1400
6	8	1484.0	2028	1804	46	1400
7	9		2028	1805	46	1400
8	10		2028	1805	46	1400
9	11		2028	1805	46	1400
	12					
	13					

Table A. 3 (continued)

Work Day	Date Day	Weighted average f.o.b. export price of cocoa (K/Tonne) (1)	F.o.b. price of cocoa incl. bounty (K/tonne) (2)	Exporters' DIS price incl. bounty (K/tonne) (3)	Average of dealers' prices for wet bean (t/kg) 4)	Dealers' equivalent dry bean price (K/tonne) (5)
10	14		2028	1833	46	1400
11	15	1466.0	2010	1830	46	1400
12	16		2010	1820	46	1400
13	17	1381.0	1925	1825	46	1400
14	18		1925	1828	47	1425
	19					
	20					
15	21		1925	1835	47	1425
16	22		1925	1843	46	1400
17	23		1925	1859	47	1425
18	24		1925	1834	47	1425
	25					
	26					
	27					
19	28		1925	1832	46	1400
20	29		1925	1834	46	1400
21	30	1413.0	1957	1832	46	1400
22	31		1957	1832	46	1400

Notes:

F.o.b. export price:

Exports are generally shipped two or three months after an export contract is signed at a given price. It has been assumed that prices paid by exporters would be influenced by export prices being obtained on contracts currently being signed rather than on shipments currently being made. Exporters are likely to have access to published and other direct information on the state of European and other overseas markets, but we have ignored this. New contracts are signed at intervals ranging from one or two days to several weeks. We have assumed that exporters are influenced by the last contract price obtained and not by previous prices. The f.o.b. export price for the three exporters as a group is calculated as a weighted average, allowing the dominant exporter a 50 per cent weight and the other two 25 per cent weights, using the last contract price for each as currently applicable. Gaps in Column (1) indicate that no new contracts were signed by any of the three exporters, so that the previous price obtains. A continuous series is given in Column (2) when the bounty is added.

The same weighting is used in calculating the exporters' delivered-into-store price.

The average dealers' price is calculated as an unweighted arithmetic mean of the four main dealers' prices, rounded to the nearest toea. The derivation from this of the corresponding equivalent dry bean price is explained in the Appendix.

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