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**Division of Humanities
Department of Social Sciences**

**The Social Influences on the Economic Decision-making of
Smallholder Cocoa Producers in Papua New Guinea: the Case of
Processing, Transport and Marketing**

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**This thesis is presented for the Degree of
Master of Social Sciences by Research (Geography)
of
Curtin University of Technology**

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STATEMENT OF DECLARATION

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ABSTRACT

In Papua New Guinea, the cocoa industry has long been concerned with low smallholder productivity and the low adoption rate of research-induced technology (Proceedings of the National Cocoa Consultative Workshop 2003; Omuru *et al.* 2001). Recent production efficiency studies (Fleming and Lummani 2001) in smallholder cocoa production in the East New Britain province, have ascertained that many farmers are not performing to their full potential given existing technology levels. While uncovering some important findings regarding 'efficiency', these studies have given scant attention to the social context in which smallholder production is carried out. In particular, these studies ignored the fact that farmers' economic practices are greatly influenced by their society and culture. There is thus a need for supplementary studies regarding smallholder economic behaviour. This study fills this gap by investigating how social factors influence smallholders' decisions concerning the production, transportation and marketing of their cocoa.

Prior to commencing this thesis, my preliminary investigations in East New Britain province suggested that transport costs bear little relationship to supply and demand market principles. For example, in 2004, a tonne load of copra cost K70 to transport to buyers in town, while a one tonne load of cocoa cost K320 over the same route. Transport costs and, similarly, marketing appear to be influenced greatly by non-market factors, such as kinship and perceptions about the relative value of the goods to be transported. Because PNG village economies exhibit a high degree of "social embeddedness", this study combines several theoretical and methodological approaches, to bring the social dimension into the analysis of cocoa economic practices. The thesis argues that socio-cultural factors greatly influence the economic behaviour and the entrepreneurial success of farmers. The results have important industry policy implications for designing agricultural extension strategies more appropriate to the socioeconomic situations of farmers.

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TABLE OF CONTENTS

	Page
Statement of Declaration	ii
Abstract	iii
Acknowledgement	iv
Table of Contents	vi
List of Tables.....	xiv
List of Figures.....	xv
List of Vignettes.....	xvi
List of Boxes.....	xvii
List of Plates.....	xviii
List of Acronyms.....	xix
Glossary.....	xx
 Chapters	
1. Introduction	1
1.0 Introduction.....	1
<i>The Economic Importance of the Cocoa Industry</i>	1
<i>Aims and Objectives</i>	3
<i>Statement of the Research Problem</i>	4
<i>Thesis Rationale</i>	4
<i>Structure of the Thesis</i>	5
2. Literature Review	8
2.0 Introduction.....	8
2.1 <i>General Remarks</i>	8

	<i>Overview of the Neoclassical Economic Framework</i>	9
	<i>The Heart of the Free Market System</i>	12
	<i>Household Actions and Responsibilities</i>	15
	<i>Household Economic Freedom of Action</i>	15
2.2	Theoretical Approaches Incorporating the Social Dimensions of Cocoa Households	16
	<i>Socio-Economics</i>	17
	<i>Communitarian Thinking</i>	18
	<i>The Social Embeddedness of Economic Action</i>	19
	<i>Development Studies</i>	20
2.3	Exchange	20
	<i>Overview of PNG Smallholder Literature</i>	22
	<i>PNG's Rural Economy and the Free Market Economy</i>	23
	<i>The Context of Production Efficiency in relation to PNG Smallholder Cocoa Households</i>	24
	<i>Changes in the Social Bases of Production</i>	26
	<i>Transport and Marketing</i>	27
2.4	Summary	28
3.	The World Cocoa Economy and the PNG Cocoa Industry	29
3.0	Introduction	29
3.1	Global Background	30
	<i>Supply Side Factors</i>	30
	<i>Main Producing Countries</i>	31
	<i>Total Cocoa Area and Yield</i>	33
	<i>World Demand for Cocoa</i>	36
	<i>The Market Prices for Cocoa</i>	38

3.2	Overview of Commercial Agriculture and Cocoa Production in PNG.....	40
3.3	The PNG Cocoa Industry.....	41
	<i>Domestic Cocoa Production</i>	43
	<i>Smallholder Cocoa Cultivation</i>	45
	<i>Smallholder Cocoa Production Costs</i>	46
	<i>Smallholder Annual Incomes from Cocoa Production and Expenditures</i>	48
	<i>Marketing of Cocoa</i>	48
	<i>The Operation of the Cocoa Stabilisation Fund (CSF) Scheme</i>	49
3.4	The International Cocoa Agreement.....	51
3.5	Summary.....	52
4.	Methods	55
4.0	Introduction.....	55
4.1	Research Methods and Data Sources.....	56
	<i>Selection Criteria</i>	60
	<i>Semi-structured Questionnaire Interviews</i>	62
	<i>Secondary Data</i>	62
	<i>A Review of the Relevant Literature</i>	62
	<i>Baseline Survey for Village Cocoa Farmers</i>	63
	<i>Survey of Cocoa Farmers Regarding Transport</i>	63
	<i>Survey of the Marketing of Export Cash Crops</i>	63
	<i>Weekly Monitoring Survey of Cocoa Farmers</i>	63
	<i>Case Study Method</i>	65
	<i>Remarks on Questionnaire and Interviewing Techniques</i>	66
	<i>Data Analysis</i>	66
4.2	Some Advantages and Disadvantages of my Approach.....	67

	<i>The Positive Factors</i>	67
	<i>Familiarity with the Socio-Cultural Background of the Population</i>	67
	<i>Respondents' Freedom of Expression</i>	67
	<i>Convenient Monitoring of Farmers</i>	68
	<i>Willingness to be Visited by Interviewer</i>	68
	<i>Trust between Interviewer and Farmers</i>	68
	<i>Home Residence</i>	69
	<i>Visit by Supervisor</i>	69
	<i>The Constraints on Fieldwork</i>	69
	<i>Some Problems of Meeting Farmers</i>	69
	<i>Drunken Brawl</i>	70
	<i>Query Regarding Monetary Rewards</i>	70
	<i>Lack of Farmers with Vehicles in Selected Site</i>	70
4.3	<i>Concluding Remarks</i>	71
5.	The Historical and Economic Context of the Study Site	72
5.0	<i>Introduction</i>	72
5.1	<i>Geography of Bougainville</i>	73
	<i>Climate</i>	74
5.2	<i>Agriculture</i>	74
	<i>Food Sources</i>	75
	<i>Population Densities</i>	76
5.3	<i>Cultural System of Land Ownership</i>	78
	<i>Dynamics of Traditional and Modern Economic Principles</i>	78
5.4	<i>The Evolution of Bougainville's Cash Economy</i>	79
	<i>Cocoa Based Economic Prosperity and Smallholder Cash needs</i>	80

	<i>Smallholder Cocoa Holdings Per Hectare Per Grower</i>	82
	<i>Smallholder Cocoa Productivity Per Hectare</i>	82
	<i>Early Participation in Cocoa Economy</i>	83
	<i>The Current Situation</i>	83
5.5	Buin District.....	85
	<i>Pre-mission Buin Life</i>	85
	<i>Family and Economic Activities</i>	87
5.6	Outside Contact through Trade, Missionary Activity and War	89
	<i>The Emergence of Buin Cash Economy</i>	91
	<i>The Second World War and Buin Economy</i>	91
	<i>Contemporary Buin Cash Economy</i>	92
5.7	Contemporary Agriculture in Buin.....	92
	<i>Marketing of Food Crops in Buin</i>	92
5.8	The Impact of the Civil War on Buin Life.....	93
5.9	Development of Cocoa Production in Buin.....	93
5.10	Overview of Study Site: Iamaru Village.....	94
	<i>Household Units</i>	95
	<i>The Socio-Cultural Life of Villagers</i>	97
5.11	Overview of Cocoa Production in Iamaru Village.....	101
5.12	Summary.....	102
6.	Results and Discussion: The Iamaru Household Economy	103
6.0	Introduction.....	103
6.1	The Pre-civil War Situation and the Present.....	104
6.2	Cash Income in Iamaru Village in 2004.....	104
	<i>Non-Farm Agricultural Incomes</i>	106

6.3	Tradestore Sales.....	106
	<i>Use of Tradestore Money for Specific Purposes.....</i>	108
6.4	Local Markets.....	108
	<i>Income From Pigs, Meat and Poultry.....</i>	111
6.5	Wage Labour.....	112
6.6	Household Expenditure.....	112
	<i>School Fees.....</i>	112
	<i>Garden Food Crop Produce and Expenditure.....</i>	115
	<i>Consumption of Processed Food Items.....</i>	116
6.7	Indigenous Exchange Networks.....	116
6.8	Summary.....	117
7.	Results and Discussion: The Social Context of Smallholder Cocoa Production in Iamaru Village.....	119
7.0	Introduction.....	119
7.1	Land Availability and Cocoa Production in Iamaru Village.....	122
	<i>Village Labour.....</i>	124
	<i>Wealth and Status in Iamaru Village.....</i>	125
7.2	Cocoa Yield Variations and the Social Circumstances of Villagers.....	125
	<i>Gender and Cocoa Production.....</i>	130
	<i>Gender Differences and Power Relations in Cocoa Sales.....</i>	131
	<i>Indigenous Exchange of Labour and Changes in Cocoa Price.....</i>	133
	<i>Using Indigenous Labour for Harvesting and Maintenance Activities.....</i>	136
	<i>Cultural Context of Incurring Excess In-kind Costs.....</i>	138
7.3	Villagers' Socio-Economic Practices: Motives for Economic Action; Buying Wet Beans.....	138
7.4	Summary.....	142

8.	Results and Discussion: The Socio-Cultural Influences on Transport and Marketing in Iamaru Village.....	144
8.0	Introduction.....	144
8.1	The Effects of Cocoa Price Fluctuations on Transport Costs.....	146
8.2	Effect of Relative Crop Values on Transport Costs.....	148
8.3	Quantity to be Transported in Relation to Farmer Income.....	148
8.4	Different Transport Charges according to the Purpose and Vehicle Used.....	149
8.5	The influence of social and kinship factors on transport costs.....	151
	<i>Village Investment in Business.....</i>	<i>154</i>
	<i>Networks of Support with Relatives and Friends.....</i>	<i>155</i>
8.6	Use of the Capital Base by Villagers.....	156
	<i>Farm Tools.....</i>	<i>156</i>
	<i>Villagers' Financial Resources.....</i>	<i>156</i>
8.7	Summary.....	156
9.	Conclusions and Policy Recommendations.....	158
9.0	Introduction.....	158
9.1	Review of Thesis in Relation to Conclusions and Policy Implications.....	158
	<i>Key Findings from the Thesis.....</i>	<i>162</i>
	<i>Policy Implications.....</i>	<i>163</i>
9.2	Recommendations for Future Research.....	164
	Notes.....	165
	Bibliographic References.....	169
	Appendix 1-a Participant Consent Form	
	Appendix 1-b Letter of Consent by Konnou Council of Elders President	

- Appendix 2-a** General Baseline Survey for Village Cocoa and Copra Farmers in Buin
- Appendix 2-b** Baseline Survey of Village Cocoa Farmers Regarding Transport
- Appendix 2-c** Survey of Marketing Export Cash Crops
- Appendix 2-d** Weekly Monitoring Survey of Cocoa Farmers
- Appendix 3:** Cocoa and Coconut Institute of Papua New Guinea

List of Tables

1.1	Per cent of Export Revenue (Million PNG kina) by Major Export Tree: Crops: 2001-2005.....	2
3.1	Major Cocoa Producers' Global Market Share (Million Tonnes), as compared with that of PNG.....	33
3.2	Land Cultivation under Export Tree Crops.....	41
3.3	Smallholder Cocoa Yield of Dry Beans in Tonnes Per Hectare.....	46
3.4	Yield of Cocoa Plantations in PNG in Tonnes Per Hectare Per Year.....	46
3.5	Labour Input and Cost of Production for Cocoa in Kina Per Tonne.....	47
3.6	Registered Fermentaries and Dealers as at 31 January 2003.....	49
3.7	The Cocoa Stabilisation Fund (Million PNG Kina): 1975-2005.....	50
5.1	Bougainville's Estimated Energy (staples) Food Production in 2000.....	76
5.2	Crude Population Density by LLG in Bougainville Province for 2000.....	77
5.3	Mean Smallholder Cocoa Productivity Per Hectare on Bougainville.....	82
5.4	Income Sources in Rural Villages.....	84
5.5	Traditional Division of Labour.....	88
5.6	Household Demographic Characteristics.....	97
6.1	Typical Tradestore Prices in Iamaru Village.....	107
6.2	Recommended Maximum School Fees in PNG Per Child in 2006.....	113
6.3	Children of Sample Households in School.....	114
6.4	Price of Items sold at the Market by Household Members.....	115
7.1	Cocoa Area Per Adult Equivalent of the 15 Households Who Perceive Land Constraints in the Near Future.....	122
7.2	Cocoa Area Per Adult Equivalent of the 21 Households Who Do Not Perceive Land Constraint in the Near Future.....	123
7.3	Typical In-kind Costs incurred by Villagers for Cocoa Production.....	137
8.1	Price of Processed Cocoa Bean Transport (PNG kina).....	147
8.2	Transport Activities and Costs (PNG kina) for a 15 km Distance.....	149

List of Figures

3.1	Main Cocoa Producers.....	32
3.2	World Cocoa Supply in Millions of Tonnes: 1960/61-2004/05.....	35
3.3	World Cocoa Demand in Millions of Tonnes: 1960/61-2004/05.....	35
3.4	World Cocoa Prices in US\$/tonne versus World Cocoa Supply: 1960/61-2004/05.....	38
3.5	PNG Cocoa Production by Sector Versus Bounty/Levy Adjusted Domestic Prices(kina/tonne): 1970/71-2005/06.....	42
3.6	Total Production versus Domestic Cocoa Prices (kina/tonne): 1974-2006...	44
4.1	Map of Bougainville Showing Study Site, Iamaru Village (Muguai).....	55
5.1	Map of Papua New Guinea Showing the Study Region: Bougainville (North Solomons).....	73
5.2	Smallholder Cocoa Production on Bougainville: 1962-63 to 2005-06.....	80
5.3	Sketch of the Study Site.....	95
5.4	Idealised picture of the 4 clans Iamaru villagers descended from.....	98
6.1	Village Income Sources in 2004.....	105
7.1	Mean Weekly Wet Bean Production (kg) Per Family.....	126
7.2	Family Dry Bean Sales in 2004.....	127
7.3	Mean Weekly Wet Bean Sales Per Household and Incomes during Fieldwork [29/12/04-26/03/05].....	131
7.4	Wet Bean Sales by Sex during Fieldwork/Seller/Harvest Round [29/12/04-26/03/05].....	132
8.1	Schematic Representation of the Factors Influencing Transport Cost.....	145

List of Vignettes

Vignette 7.1:	Wet Cocoa Bean Contributions for Meeting Funeral Expense.....	129
Vignette 7.2:	Raising Money from Cocoa for Brideprice.....	130
Vignette 8.1	Helping Family Members.....	151
Vignette 8.2	Offering Transport Price Discounts to Trusted Individuals.....	152
Vignette 8.3	Wealth Sharing Dimension of Transport Services.....	153

List of Boxes

Box 7.1	Case Study for Farmer #2.....	134
Box 7.2	Case Study for Farmer #20.....	136
Box 7.3	Some Reasons for Buying Cocoa in the Village.....	141
Box 8.1	Case Study for Farmer #36.....	150
Box 8.2	Case Study for Farmer #23.....	154

List of Plates

4.1	First Arrivals for the Briefing Session, 28 December 2004.....	57
5.1	Typical Bush Material House.....	99
6.1	Farmer and Daughter in Front of their Tradestore.....	107
6.2	Typical District Local Market on Bougainville.....	109
6.3	A Farmer with Tobacco Plants (left) and Drying in Garden Shelter (right).....	110
8.1	A Typical Smallholder Vehicle during Fieldwork.....	146

ACRONYMS

CCI PNG	Cocoa Coconut Institute of Papua New Guinea
BDC	Buin District Centre
BHM	Bakutu Highway Market
BPNG	Bank of Papua New Guinea
BTM	Buin Town Market
CCIPNG	Cocoa Coconut Institute of Papua New Guinea
HA	Hectare
WBKG	Wet Bean in Kilograms
DBKG	Dried Cocoa Beans in Kilograms
DBE	Dried Bean Equivalent in Kilograms
DBKG	Dried Bean in Kilograms
ENBP	East New Britain Province
KG	Kilogram
K	PNG kina
LLG	Local Level Government
PNG	Papua New Guinea
PNGCB	Cocoa Board of Papua New Guinea

GLOSSARY

- AGMARK** A major buyer and exporter of PNG cocoa, whose branch was the sole buyer of dried cocoa beans in Buin during fieldwork. The company is headquartered in Kokopo, East New Britain Province. Its branch in Buin town has a warehouse for storing dried cocoa beans and copra for shipment to Rabaul in the East New Britain Province for overseas shipment.
- BHM** Bakutu Highway Market, conducted every Friday along the Buin-Kieta highway at the junction of Muguai road. This is close to the Iamaru village, and some Iamaru households sometimes attend this market to buy fish or other protein.
- BTM** Buin Town Market, the main local district market. Some women from Iamaru village go to this market to sell bananas, greens and sometimes, sweet potato.
- Buins** In the thesis, the term 'Buins', is used to refer to the indigenes of Buin LLG (Figure 4.1, p.55). The sketch of the area is on Figure 5.3 (p.92).
- CCI PNG** Cocoa Coconut Institute of PNG carries out research on cocoa and coconuts in PNG. Its main objective is: "to develop high yielding varieties of both crops with the ultimate aim of increasing incomes, and hence, standard of living of the rural farmers", who are the major producers of both crops.
- CSF** Cocoa Stabilisation Fund is a commodity fund made up of tree crop commodity levies during high prices and kept at the Bank of Papua New Guinea. Funds are released for maintaining farmers' incomes in the form of bounty payments during low commodity prices.
- LLG** Local Level Government-administrative centre at the district level and/or within the district.
- MSM** Muguai Sunday Market, conducted after church service every Sunday at the Muguai Catholic sub-parish. Older people and youths from Iamaru village often attend this market. Some Iamaru female heads of household sell greens, banana, roasted cassava and sweet potato at this market. Some villagers buy protein, especially smoked fish when on sale.
- PNG CB** PNG Cocoa Board is a regulatory marketing body established by an act of Parliament. Its responsibility is to oversee the industry in the areas of marketing, quality, production and the relevant policy areas.
- PNG** The independent state of Papua New Guinea.

QEB

The Quarterly Economic Bulletin of the Bank of Papua New Guinea (BPNG) which publishes economic statistics (including tree crop commodity statistics).

CHAPTER 1: INTRODUCTION

1.0 Introduction

To set the context of the study, Chapter 1 very briefly states the economic importance of the cocoa industry to PNG's national economy in terms of national export revenue, rural income and employment for the cocoa growing households in the country. This is followed by a statement of the aims and objectives of the study, the research problem, rationale of the thesis and finally, the structure of the thesis.

The Economic Importance of the Cocoa Industry

Cocoa is an important export crop for PNG in terms of export revenue, employment and income for rural households. The national government's priorities of rural road infrastructure and a range of economic incentives such as price and income stabilisation and input subsidies attest to the importance of cocoa production to the rural and national economy (*The Medium Term Development Strategy [MTDS] 2005-2010*).

Cocoa was the second most valuable crop after coffee until 1990 when it was surpassed by palm oil (Fleming and Milne 1999: 3). Its share of agricultural export revenue increased from 1995 to 2002 (Lummani 2003), but since then, low world cocoa prices, the stronger value of the domestic currency against the US dollar, and lower production due to bad weather have contributed to lowering the contribution of cocoa to total agricultural export revenue (PNG Cocoa Board Quarterly Market Reports 2004-05). Despite frequent unfavourable production conditions, smallholder cocoa output increased by 3.5% per year over the period from 1979 to 2005.

Cocoa earned about K110.3 million in 2001, K226.3 million in 2002, K257.70 million in 2003, K218 million in 2004, and K198.70 million in 2005. Table 1.1 shows the share of export revenue contributed by major export tree crops in PNG Kina over the last five years.

Table 1.1: Per cent of Export Revenue (%) by Major Export Tree Crops: 2001-2005

Year	2001	2002	2003	2004	2005
Export Tree Crop					
Coffee	23.6	25.5	21.5	19.1	33.9
Palm Oil	36.3	35.9	30.3	28.4	29.9
Cocoa	15.6	20.9	18.5	14.7	14.1
Copra and Copra Oil	5.3	4.1	5.3	6.6	7.9
Tea	2.7	1.7	1.4	1.5	1.4
Rubber	0.8	0.8	0.9	0.8	0.9

(Source: BPNG Quarterly Economic Bulletin: March Quarter (2005). Note: the table does not include the value of semi-processed agricultural exports)

Despite the importance of smallholder production to the national and rural economies (70% of total national cocoa production), smallholder productivity on a per hectare basis has generally been low at less than 450 kg/ha/year and considerably less than plantation productivity of around 1000 kg/ha/year (Chapter 3, Table 3.4, p.46). Smallholder cocoa productivity is well below industry expectations given the availability of high yielding materials which have been distributed successively at six year intervals: 1982, 1988, 1994/95 and 2000. Farmers do not appear to have been able to sustain higher yields from successively improved planting materials (Omuru 2003; Omuru *et al.* 2001).

The national government is pursuing an export driven strategy of economic recovery and growth and, hence, gives prime importance to issues of productivity in the agricultural sector (MTDS 2005). In line with this, a cocoa consultative workshop was convened in July 2003 to identify ways of addressing the constraints on productivity and related issues including cocoa quality (Proceedings of the National Cocoa Consultative Workshop 2003). The workshop highlighted constraints at the institutional (government, industry and extension delivery) and farmer levels. Several studies (e.g., Omuru *et al.* 2001), indicate that constraints on cocoa productivity at the smallholder level include: greater return expenditure on investment in alternative export crops, lack of knowledge about government support schemes, high levels of pest and disease problems, poor block management, and high costs of planting materials and inputs (see, for example, Proceedings of the National Cocoa Consultative Workshop 2003). Smallholder studies by Fleming and Lummani (2001), have shown that smallholder productivity could be improved significantly

even without improved technologies simply by improving extension service delivery mechanisms. However extension services have been declining over the last decade. The foremost reason is lack of financial resources for extension activities. Other problems include poor housing and low wages for extension officers, inadequate training and extension manpower, and low mobility due to inadequate numbers of vehicles (Proceedings of the National Cocoa Consultative Workshop 2003). There are also problems in extension with poor planning and administrative procedures (Proceedings of the National Cocoa Consultative Workshop 2003). Many difficulties are endemic, and have existed for a long time affecting the morale and motivation of field officers (e.g., no fuel for vehicles). Policy makers sometimes have different ideas about how to manage or solve these problems (see Proceedings of the National Cocoa Consultative Workshop 2003). If these issues were addressed effectively and efficiently, an effective extension programme would have the potential to improve productivity of the cocoa farmers and increase the national government's agricultural export revenue base, in line with its export driven strategy. However, given the limited resources of the government at all levels, these problems with extension are likely to continue for the foreseeable future.

Aims and Objectives

The three main objectives of the thesis are to:

- investigate the social aspects of the economic decision-making processes of smallholder cocoa farmers in PNG in relation to management practices and productivity, focusing on the transport and marketing of the crop;
- contribute to developing a better understanding of the social context of cocoa production to facilitate the development of more appropriate smallholder-oriented policies; and
- identify ways of improving smallholder productivity and efficiency based on the study's findings.

Statement of the Research Problem

The research concerns the social context of smallholder economic and/or entrepreneurial decision-making in cocoa production and productivity. The investigation is based on a case study of smallholder cocoa households in Buin district, south Bougainville, focusing on the processing, transportation and marketing of the crop. Past studies (Fleming and Lummani 2001; Gimbol 1993), on cocoa smallholders in PNG, involved ascertaining the production efficiency of smallholder cocoa households within a neoclassical economic framework. Gradually, it was also recognised that, in a partly monetised economy, notably in rural areas, where non-market exchange is still common, closer investigations into the indigenous economic relations would be helpful for obtaining a further understanding of the economic behaviour of the households. Such investigations would help uncover the reasons why farmers perform poorly in productivity terms despite the improved planting materials that have been distributed over the years. This knowledge could help in terms of improving the effectiveness of extension service delivery of new technologies aimed at raising rural household cocoa productivity and incomes.

Thesis Rationale

Investigations of cocoa smallholder productivity have emphasised the role of improved planting materials, road and marketing infrastructure and facilities, and the provision of improved monetary incentives for boosting labour productivity. Much has been done (and is still being done) to increase productivity, but the personal, socio-economic and cultural factors that may influence the performance of farmers have largely remained a grey area, partly because of the difficulties of quantifying and weighing them appropriately. However, Fleming and Lummani (2001), even when using a neoclassical economic framework to examine the behaviour of PNG cocoa smallholder households, have recognised the importance of the influence of non-economic and social factors on the behaviour of cocoa households. For instance, the generally low re-investment (less than 10% of cocoa incomes) in block maintenance was, in part, attributable to the fact that households live and operate in communal societies where kinship and indigenous exchange obligations, norms and social status, place financial constraints on households (Omuru 2003: 61-66; for a

fuller discussion see Blatter 2003). Thus, the motivations underlying the commodity production behaviour of smallholder farmers are varied and complex and are not driven purely by market incentives. Household production activities can be motivated by individual goals as well as communal social goals. At times, the economic rationale is subordinated to other social goals depending on individual household situations or circumstances (in this regard, see for example, Curry 1999, 2005a; also Barret 2005; for a discussion of traits of entrepreneurs, see Schaper and Volery 2004). Therefore, economic assumptions such as the profit motive need to be considered in the context of social and economic goals involving other economic logics. This is an area in need of investigation in order to disentangle the different economic and social logics influencing smallholder productivity. This is therefore the rationale for this thesis.

Structure of the Thesis

Chapter 2 briefly reviews the critiques of the basic tenets underlying the neoclassical economic framework in relation to smallholder cocoa households in PNG. This is followed by a discussion of social theory and its relevance to the context of cocoa households' realities. It also provides a brief overview of the contrasts between PNG's indigenous economy and the market economy. This is followed by an overview of rural household labour, drawing out its socio-cultural dimensions in the light of the study's framework. Finally, Chapter 2 briefly discusses transport and market accessibility, specifically noting its weak impact on cocoa output and, thus, the strength of socio-cultural influences on smallholder cocoa production behaviour. Overall, Chapter 2 shows that the rural cocoa economy is driven by a mixture of market and indigenous non-market principles and assumptions that are not always in accord with each other.

Chapter 3 provides a brief overview of global production of cocoa and PNG's place in the world production of cocoa, pointing out common concerns and efforts among cocoa producing countries regarding smallholder cocoa productivity. Chapter 3 notes that cocoa is a primary source of livelihood in the developing world. Furthermore, Chapter 3 notes that neo-liberal driven global market reforms constrain national

governments' role of minimising cocoa price fluctuations and uncertainty through various mechanisms.

Chapter 4 provides an outline of the study's field site and methodology. The chapter explains why a multi-method approach was adopted for the study, and outlines some of the constraints on conducting fieldwork in Buin. Brief reflections on conducting fieldwork as an indigenous member of the community are also provided.

Chapter 5 briefly discusses the physical, historical and economic context of Bougainville and Buin, highlighting some of the dynamics of indigenous socio-economic principles and attitudes in the context of an increasingly monetised economy. The historical background highlights the fact that cocoa production was established by the Colonial Administration in order to involve indigenous people in an introduced cash economy. Thus, the reason for indigenes' increasing cocoa production in an evolving rural economy is, partly, a response to increasing cash needs in contrast to undertaking cocoa plantings as a direct result of mere profit motive as would be the case in commercial farm operations.

Chapter 6 discusses non-cash crop sources of income in the Iamaru village household economy. The discussion is based on data relating to the non-cash crop income sources derived from the surveys of the 36 households over the 12-week period in 2004-05. The chapter, first, describes the characteristics of farming household assets, followed by an analysis and discussion of the sources of household income, their relative importance in the village economy, and the main areas of income and cash expenditure. The final part of the chapter briefly discusses how assets and cash move through market and non-market exchanges in the context of the village economy. The chapter points out that, indigenous social and economic relationships provide the mechanisms by which the economic actions of households are mediated which, in turn, affects households' profit-driven cocoa productivity and efficiency.

Chapter 7 discusses cocoa production in Iamaru village from a livelihood perspective, and argues that the output of cocoa work is more than simply cocoa production and cash incomes (i.e., it fosters and strengthens social relationships which yield economic and social benefits to the individuals and families involved). This is discussed within two broad themes: i) the social side of cocoa production, and ii), the material side of cocoa production. Case studies are presented which illustrate, within the framework of my argument, how socio-cultural factors mediate cocoa production activities and decision-making.

Chapter 8 discusses cocoa transport and marketing in Iamaru village. First, it discusses how transport operators set charges depending on vehicle condition, and fuel and spare part costs. Then the paper explores how cocoa value is shared between the transporter and the farmer, depending on changes in cocoa prices (i.e., more is charged when cocoa prices rise and vice versa). Low cocoa prices make reinvestment in spare parts and maintenance difficult for transporters because they charge less for transport when prices are lower. This is further complicated by the operation of socio-cultural factors, which, sometimes, influence cocoa transport and marketing costs, such as i) the type of relationship between the transporter and the farmer, ii) the socio-economic status of the farmer, and iii), financial, personal (or other) circumstances at a point in time.

Chapter 9 draws some conclusions and policy implications in the light of the discussions in the preceding chapters. First, it provides a brief review of the thesis as a whole in relation to the policy implications and conclusions. This is followed by highlights of the key findings and their policy implications. The chapter ends by suggesting some promising future research directions to be pursued by tree crop commodity research institutes in PNG. Overall, it points out the inappropriateness of current extension policy approaches towards smallholder cocoa households, and highlights the need to take into account the lifestyles of rural households in designing extension strategies for increasing productivity and incomes.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This Chapter has several aims. First, to review critiques of the main assumptions underlying the free market economy with the aim of determining the extent to which the assumptions reflect the realities of PNG cocoa growing households. Second, to briefly examine some broad theoretical approaches including: i) socio-economics, ii) communitarian conceptions of the economy, iii) Polanyi's concept of social embeddedness of economic action and, iv) Development Studies. Third, to summarise key socio-economic studies of cocoa smallholders in order to contextualise the theoretical discussion and thus to demonstrate the inadequacy of neoclassical economic assumptions in such a context. Fourth, the social basis of labour in the production process is briefly discussed in order to highlight its relevance for understanding smallholder production in rural PNG. Finally, the concept of non-market exchange is briefly discussed in relation to the socio-cultural context of farming households in PNG. Accordingly, an overview of the indigenous economy is provided drawing out its similarities and differences with the market economy in order to move to a closer representation of the reality of smallholder production in PNG.

2.1 General Remarks

In general, the historical development of neoclassical economic theory, its assumptions and hypotheses, are commonplace knowledge within the social sciences. However, because this critique of neoclassical theory is central to my arguments, it is necessary that I provide a brief overview of these arguments.¹

Growing recognition of the problems with neoclassical theory, especially in developing countries has contributed to a reconsideration of the neoclassical school of thought (e.g., Meier 1970; for overviews of various versions of methodological individualism, see Udehn 2002: 479-507). There was a gradual realisation that the

problems of developing economies were to some extent characteristically different from those of developed countries, and this has led some economists to take the view that the concepts and analytical tools developed from neoclassical theory are inappropriate for use in developing countries. These economists argue that the concepts and analytical tools of precision used in economics were developed in the context of the socio-economic realities of developed economies and are therefore more suitable there for use. In contrast, the micro level socio-economic reality in developing economies such as in PNG, invites lack of precision because of the high degree of social embeddedness of the economy. This awareness has manifested itself, for example, in terms of emphasis on certain problem domains and particular concerns among economists, such as those identified by the New Institutional Economics associated with Ronald Coase in America. Furthermore, in developed countries, calls came from other social science disciplines, and also from within mainstream economics for a reconsideration of economic strategies (i.e., conventional economic policy measures: monetary and fiscal policy instruments, especially with regard to enabling desired outcomes such as full employment and equitable distribution of goods and services and incomes), especially in view of the emergence of new problems relating to, for example, the market's self-regulatory efficiency and distributive and global issues (see for example, Boland 1982; Heilbroner and Thurow 1998; Streeten 2002; Stiglitz 1999).

Overview of the Neoclassical Economic Framework

Some writers (e.g., Boland 1982: 29; Heilbroner 1986: 311-7), have pointed out that the assumptions underlying neoclassical economics were derived from 17th to 19th century European contexts and were later generalised as representative of human facts and realities to other societies. There is also debate about whether economic laws are derived from some conception of human nature generally or are empirically established. In this debate, the Austrian School of Economics, notably following on the tradition of eminent economic theorists such as Ludwig von Mises [1881-1973], and Friedrich Hayek [1899-1992]), defended the position that economic laws are derived deductively, while economic theorists like Meerhaeghe (1980: 90), have argued that initially, in the UK (1700s-1800s), the inductive method

was used but, once the principles had been established, the deductive method was followed (see also Heilbroner and Milberg 2002).

The inductive approach would be more appropriate in relation to the behaviour of cocoa households in rural PNG, especially in the light of the relatively high level of social embeddedness of their economies. This is because the inductive approach begins with the immediate realities of people rather than from abstract principles deduced from basic assumptions about what is intellectually conceived and articulated as the nature of human beings generally. The deductive approach is said to rely on psychologism, the view that one can explain social processes solely by reference to the psychological states of individuals, or in other words, all the laws of society must be explicable in terms of human nature (i.e. laws of the mind) (for fuller discussion, see Popper 1966; Boland 1970; Udehn 2002). A difficulty with this view as stated by Boland (1970) is how to define the content of human nature, which has changed over time (see also Boland 1982: 33). In light of these difficulties, it has been argued that economic theory should be rooted in reality, although renowned economic thinkers such as Friedman (1953) of the Chicago School, argue that it does not need to be rooted in reality as long as it has a predictive value for the economic behaviour of individuals. Heilbroner and Thurow (1981: 87) endorse this view that the focus on the rational and acquisitive elements of people in economics is predictive economic behaviour. But it has been increasingly recognized, as Heilbroner (1986: 315-25) pointed out, that the basic ideas underlying neoclassical economics are affected by changing societal circumstances. In this, he referred to irregularities in the supposed regularities in human behaviour, due, for example, to instabilities in social order, globalisation and the changing geography of production prevalent in modern times (see also Heilbroner and Thurow 1998: 3-25). Similarly, Lowe (1969:1-36) has argued that, in modern times, the motivational and behavioural patterns of marketers, especially in developed economies, has changed and are thus no longer the same as they were at the time of the great economists such as Adam Smith (1723-1790), David Ricardo (1727-1823), and Thomas Malthus (1766-1834). Hence, the claim that, although economics may predict an individual's behaviour in society, other variables such as socio-cultural factors can also exert a significant influence, depending on the individual's personality and other circumstances.

By and large, such concerns about the market have been increasingly gaining attention over time. In the late 1960s, Hook (1967), for example, pointed out that although the capitalist market, comparatively, has been the most efficient in serving the varied needs of society, in other respects it cannot be relied upon as assumed in theory. For example, he argued that its inability to automatically achieve balanced budgets, equitable distribution of goods and services, and quality of life, testifies:

...to the fact that the intelligent quest for desirable ends in a world of limited resources requires reflective consideration of economic means...(1967: x).

Similarly, Economics Nobel Laureate, Stiglitz (2002), has openly expressed discontent about free market driven globalisation and its implications. Further, in the *Roaring Nineties* (2003), he argued that the US had trusted too much in the market's self-regulatory efficiency and failed to achieve the balance between the government and the market. Along the same lines, Lutz and Lux (1979), amongst others (e.g., Lawson 2003; Langlois 1989), have argued that the neoclassical conception of the market, could not account for the complexities of the dynamics of change in an economy. Such concerns point to the need for economics to take into account the findings from the other social sciences to help refine its methodological approaches and improve its procedures and techniques of analysis (Machlup 1969: 99-129; see also Zamagi 2000; 2004).

One school of thought which sought to account for societal realities in its application of economic thought has been the American 'Institutionalism', associated with Veblen Thorstein (1857-1929), and others (e.g., John R. Commons [1862-1945]; Clarence Ayers [1904-1962]). This school generally holds that: "institutions, or settled habits of thought coming from the generality of men, notably usage, customs, canons of conduct, principles of right and propriety (i.e. not profitability alone) determine economic activity" (Meerhaeghe 1980: 102). Accordingly, as Tridico (2003) pointed out, institution-oriented schools of economic thought such as the Old American Institutional School, sought to apply reasoning from the other social sciences in economics. By contrast, the New Institutional School (which seeks to combine both theory and institutions) as stated by Liber cap (1998), has been criticised for attempting to explain political, historical, economic and social

institutions such as government, law, markets, social conventions, and the family, in terms of neoclassical economic theory. The argument was that, although social institutions may appear in neoclassical models, they are there only as endogenous variables because a successful economic explanation requires all exogenous variables to be reduced to psychological states of individuals (Udehn 2002: 4). Adherents of the neoclassical school, however, argue that the focus on the social and historical context views individuals as merely passive reflections of these, arguing that the 'agentless' emphasis on social structures is characteristic of Marxian, radical, and institutionalist theory (see for example Lowenberg 1990: 619-639).

In light of the socio-economic realities in many developing countries, a combination of theory and practices from many fields and disciplines has often been used by many development agencies and development practitioners. The 'livelihood approach' is an example which addresses economic development issues in which the livelihoods of poor people are put at the forefront of analysis and action (<http://www.odi.org.uk/rpeg/srls.html>; see for example Ellis 2000; Haan and Zoomers 2005). Among the notable international development agencies, the British Overseas Development Institute (ODI) adopts and uses the livelihood approach to address poverty issues, mainly on the African continent. This approach is founded upon the basic concepts of social relations, institutions, organisations, and power relations, and studies household livelihoods in developing economies within the framework of assets, access, and activities.

Although critiques abound from various perspectives, many have often highlighted that the basic tenets of the capitalist market economy of individual liberty and rationality are rooted in neoclassical economic theory: two concepts underlying the so-called methodological individualism (cf. methodological holism, Boland 1970), associated with the strong affirmation of individual rights in democratic countries, especially Western societies.

The Heart of Free Market System

This strong affirmation of individual liberties and rights, as stated by Boland (1982: 29) was born out of a certain period of time, within the context of the

circumstances at the beginning of an industrial age and its associated political change in Europe. Similarly, Heilbroner and Thurow (1998: 11-25) stated that such ideas were shaped by the socio-political atmosphere of the time, notably as a counteraction to the authoritarianism of Medieval Europe. For this reason, social and political thinkers from the 17th -18th centuries (e.g., Smith [1723-1790]; Bentham [1748-1832], Mill [1806-1873], Bastiat [1801-1850]), generally placed a strong emphasis on the idea of absolute individual liberty and rights at the centre of social and economic life of society. Thus as Boland (1982) stated, it was also for intellectual reasons that strong free market adherents such as Hayek (1949) of the Austrian School, promoted the view that individuals are free to decide their own fate in order to avoid authoritarianism and any ideology based on holism (e.g., communism and socialism). Similarly, another Economics Nobel Laureate, Kenneth Arrow (1969: 3-21), in his discussion of 'public versus individual choice', defended the individual choice of action.

In the neoclassical framework, the methodology of economic decision-making is associated with the concept of rationality underpinned by specific basic assumptions, notably: self-interest, perfect information, conscious deliberation and representative agent (for discussion on these, see for example Langlois 1989; 2004). In this regard, a common view among many writers within the social science disciplines (e.g., Katona 1975; Rabin 2002) is that, neoclassical economics is dominated by one theoretical idea: rational self-interest, and that much of its theory consists of working out what rationally self-interested individuals would do in a given situation. Economists, however, argue that such a view by social scientists is based on a biased understanding of basic economic concepts, arguing that self-interest does not necessarily mean exclusive self-interest and, is inclusive of moral sentiments/values (e.g., Langlois 1986b; Heilbroner and Thurow 1981; Lowe 1969; Boland 1982; Lutz and Lux 1979; also Arrow, Boulding, Albin, Friedman in Hook ed. 1967; for critiques see Denis 2004; Boettke 1996).

This argument, generally, accords with a view that holds society as a collection of self-interested individuals in a state of nature without culture as Udehn (2002) has argued. The idea in this argument as Popper (1966: 55) pointed out is that only individual entities and their behaviour matter, and that these give rise to the

larger social patterns and institutions which are the unintended social consequences of intentional human actions. Popper (1966) argued that how individual behaviour leads to larger social patterns and institutions should be the main concern of economics and kindred social sciences. This accords more with the 'analytic-reductionist' way of thinking, which assumes that a given phenomenon requires first, an understanding of a more fundamental level of reality (say, an individual entity and his/her utility maximising behaviour/aims/intentions) from which larger social patterns and institutions are constructed. Such a view, especially in microeconomics, has been critiqued from various perspectives. Lutz and Lux (1979) from a humanistic point of view, for example, have argued that the individual and his/her aims and values have been elevated above the community, in that, this does not allow for economic decision-making at the level of socio-economic units such as family, clan or other forms of association (cf. Becker and Murphy 2000).

Such a line of thinking as elucidated by the above argument tends to disallow the concept of social embeddedness where rural households as in PNG are the basic social and economic decision-making units in which the social and economic are closely interwoven (e.g., Waddell and Krinks 1968; Curry 2005a). Along the same lines, Sorn-Friese (1998: 2) has argued that social embeddedness is a 'relational' concept and that the social context is not an exogenous force and thus social institutions should not be analysed separately from the economic activities of the business firm (see also Loasby [1967] 2003). This view underscores the lived reality of smallholder cocoa households in PNG because, as members of the rural community, their behaviour and decision-making processes are affected by factors at the heart of community processes such as kinship relations involving solidarity, reciprocity, reproduction and alliance, and socio-cultural practices in the processes of commoditisation, often with profound influence on their relationships, and definitions of their personhood and identity (see for example Strathern and Stewart 2000: 372-386; Polier 2000: 197-212). Further, in this regard, Polanyi (1944) argued that social factors do have influence on commodities, markets and the economy.

Household Actions and Responsibilities

In the light of the foregoing discussion, it does not seem to be the case that cocoa households have to carefully deliberate on their choice to produce cocoa or not. Cocoa is their source of income and, if anything, smallholder cocoa households are concerned with maximising utility in terms of pressing short-term cash needs associated with changing patterns of consumption in addition to their social and cultural obligations. This is also clear given that the industry does have some knowledge about household expenditure patterns through information collated through cocoa household surveys (e.g., Lummani 2001; Lummani and Nailina 2001). Furthermore, the household's limited cash options (Lummani 2001), direct its choice of action, in terms of available incomes, towards priority areas such as their children's education and health. If households are to be profit maximisers, then productivity, efficiency, and innovation, must become priority areas in their production activities: the profit motive as a basic directive of a household's actions is a key to acting commercially. The industry, however, has no control over the actions and responsibilities of households who, in fact, behave rationally in their actions in relation to the responsibilities of their own particular situations.

Household Economic Freedom of Action

The lifeworlds of smallholders and their families need to be taken into account because this is where they live and make production and consumption decisions. In the village situation, they cannot escape these lifeworld demands. Furthermore, their decision to move to live elsewhere is restricted by lack of income, investment, education, traditional land tenure structures and networks of social obligations. However, within these parameters, the choices they make are real choices and ones capable of being made, but this does not mean that their actions are necessarily forced by social obligations and limited cash options (see for example Ahai 1991: 10-15), but rather that their freedom of economic action is part of the social processes of change. Thus, the absolute economic freedom and behaviour assumed in the neoclassical framework seem to be far from reflecting the true reality of PNG rural cocoa households.

Schumpeter (1934: 80) critiqued the notion that because of custom and habit, economic behaviour is culturally relative, arguing that 'rational egoism' universally rules buyers and sellers. In the light of my arguments in the preceding paragraph, this is too narrow a view of market. To this I want to add that it is true that some people buy commodities in order to sell elsewhere for profit, while others buy in order to use them. But the local markets in which cocoa households participate have a social value in themselves (e.g., meeting friends, relatives and, carrying out all sorts of interpersonal transactions). So cocoa growers are people involved in money making activities in an increasingly monetised economy but whose profit motives are modified by socio-cultural factors.

The above general and brief review of critiques from within and without the economics discipline, points to the theoretical challenges to the claims of economics, and, as argued above, highlights the need for economics to be open to the reasoning and findings from other social sciences. Such an approach would be theoretically valuable for explaining the economic behaviour of rural farming households in developing economies such as PNG, where most people live on communally owned land and derive part of their livelihood from a subsistence economy. Thus, an understanding of their economic behaviour based on economic concepts, if supplemented by an understanding of the socio-economic realities of rural farming households, could provide a more accurate picture of rural families and their economic decision-making processes.

2.2 Theoretical Approaches Incorporating the Social Dimensions of Households

In light of the foregoing discussion, this study draws on several theoretical approaches. These include: socio-economics, communitarian thinking, Polanyi's (1944) concept of the social embeddedness of economic action and development. Although the approaches have varied emphases, basically, they share a common view of individuals as 'relational' beings. This view, whether explicitly stated or not, seems to permeate the writings of authors in this vein (e.g., Polanyi 1944; Tomer 1999; Etzioni 1999; Coughlin 1991; Lea 1996). Accordingly (although this is by no means a new idea), individuals are understood as being born into relationships and

being nurtured by them. Thus, the lives of individuals are sustained by shared values that also serve as behavioural constraints, as opposed to their living solely by individualistic values. Therein, these social theories share a view of economic behaviour being embedded in society rather than existing separately from the social context of peoples' lives. Writers such as Sanghera (1997: 19), echoing Polanyi (see below), argue that, although embedding in formal economic models is ignored or seen as imperfect or irrational, nevertheless it is required in economic relations in some form or another, and can be an effective way of doing business, and thus it is far from weakening economic rationality.

Socio-Economics

The socio-economic framework is commonly associated with Etzioni's work in the 1980s and 1990s, and is concerned with combining economic and social perspectives to provide an improved understanding of economic behaviour in general. The main view (see Etzioni *Essays in Socio-Economics* 1999) is that social institutions mediate economic behaviour. The institutions of concern are those that form the context of economic behaviour, for example, business firms, the social organisation of markets, social networks, political entities and legal institutions, and cultural norms (Coughlin 1991: 169). Thus, in general, the socio-economic framework critiques narrow individualism and rationality, arguing that moral commitments are also causes of human action in contrast to the notion of self-interest as the sole determinant of behaviour. For example, a brief platform of socio-economics published by SASE (The Society for the Advancement of Socio-Economics) in 1990 states:

...socio-economics assumes that economics is embedded in society, polity and culture, and is not a self-contained system. It assumes that individual's choices are shaped by values, emotions, social bonds, and judgements rather than by a precise calculation of self-interest (SASE 1990, cited in Coughlin 1991: 159).

Such a framework is relevant within the context of rural socio-economies as typified by PNG's cocoa farming sector. As Tomer (1999) argued, from the socio-economic standpoint, the productive capacity of a firm is embedded in society, while in contrast, the neoclassical perspective on the firm does not account for the fact that firms are partially embedded in society. Accordingly, productive capacity is, in part, embodied in organisational (or social) relationships among people, not simply embodied in individuals. Although his argument was based on a developed country context, his argument is relevant to PNG in that investing in social capital could improve social relationships thereby improving productivity, worker well-being and social performance. PNG households, for instance, irrespective of whatever their commercial orientation might be, operate in a context where non-market behaviour such as security, closeness, humanity, and social connections are just as important as market behaviour (e.g., Wiro 1999).

Communitarian Thinking

Since the mid-1980s, Etzioni has been a notable proponent of communitarian thinking primarily focussed on encouraging higher levels of morality and the rebuilding of institutions of civil society (Etzioni 1999: 158-163). As Coughlin (1999) pointed out, communitarianism was largely restricted to a debate among philosophers and political theorists, primarily focused on the critique of utilitarianism and individualistic liberalism (e.g., see Lea 1996; Avineri and de-Shalit 1992; Etzioni 1995). The direction that Etzioni took, according to Coughlin (1991), was to explore its implications for a broad range of public policy and private behaviour (see also Etzioni 1993), which, hitherto, had not been the case.

As Coughlin (1991: 170) discussed, communitarianism focuses on those institutions that influence moral development, a process in which the family plays the largest role, followed by the school, neighbourhood and wider community as crucibles of civic virtue. One of its features, in contrast to socio-economics, is that, it also aims to reform society rather than just to study it (for a comparison of the two approaches, see Coughlin 1991: 161-71; see also Coughlin 1996).

The Communitarian frame of thinking is relevant in rural socio-economies in PNG in that it views the social context as the basis for understanding the behaviour of individuals and their lives as a reflection of what the community requires of them as individuals, and as members of the family unit, clan, or tribe. Although this may be viewed as a counteraction to the concept of individualism associated with neoclassical theory, it accords to some extent with the reality that reflects the social and economic situation of rural households in PNG. For example, an important responsibility for those living in a PNG community is to participate in fulfilling one's social obligations (see for example Curry 2003; Imbun 2000). In this respect, farming households, as producers of cocoa, would also remain aware of socially appropriate actions that could build or destroy relations that make up life in a community which, in turn, have a bearing on farming household profit and costs of production. This difference with the socio-economics approach is also a key point about the PNG households where economic behaviour is driven by the need to maintain relationships, not to undermine them.

The Social Embeddedness of Economic Action

The idea of the socially embedded economy conceptualised by Polanyi (1944), highlights the inseparability of the social and the economic (see Curry 1999, Koczberski and Curry 2004; Imbun 2000). It is now widely acknowledged that many economic transactions, especially in the indigenous economies of developing countries such as PNG, contradict the assumption of the separability of markets and society that underlies conventional economic analysis (see for example, Cornelisse 1984: 254). While communitarianism and socio-economics acknowledge that the economy is socially embedded, Polanyi (1944) argued that the economy is essentially a function of the interaction of social and market relations. As Cornelisse (1984: 254) pointed out, although individuals' transactions at the personal level are often measured by recording their frequency and intensity and are quantified for modelling purposes, the existence of qualitative human attributes and socio-cultural factors that sometimes influence human behaviour limit the explanatory power of such models. For instance, Berry (1975: 5) argued, using a Nigerian case study, that socio-cultural variables (including religious and moral variables) are generally

viewed by economists as impediments to the free flow of market information and resources from less to more productive economic uses. As pointed out in Section 2.1 (pp.15-6), markets are more than just about economic returns; they are also about social returns to the community.

Development Studies

Finally, the study draws on ideas from Development Studies. Recent critiques of development, in part, arise from dissatisfaction with the results of development models derived from western economic theories that assume a universal development trajectory. Such models tend to superimpose a uni-dimensional form of development across the globe (often akin to a western style of development) (see Escobar 1995; Corbridge 1995; Schech and Haggis 2000; 2002). It has been argued that one outcome of this discourse of development is the mental reorientation of indigenous peoples in how they perceive themselves and their relation to others in the context of development. Thoughts deriving from such an understanding would be useful in terms of establishing alternative forms of development congenial to the socio-cultural and economic realities of rural farming households. For example, James (2002: 269-292) has argued, in the case of Tonga, that understanding of the basic units, goals and means of achieving these goals among the traditional, rural or the grass roots' sector should help the current developmentalist emphasis on informal sector growth. Similarly, Horan (2002: 205-221) writing on the same country has argued about the funder's lack of understanding about the existence of hybrid economic systems that challenge macro-economically driven development policy in the Pacific (for similar studies see Anderson 2002; Peredo *et al.* 2004; Curry 1999).

2.3 Exchange

Exchange is a basic fact of life. The entire discussion so far, presupposes an exchange economy involving both monetary and non-monetary transactions in developed market economies, as well as in semi-subsistence economies.

Exchange in markets has been viewed as utilitarian and very restrictive where only commodities are for sale and the satisfaction of individual needs occurs through the exchange of commodities. Lutz and Lux (1979: 127-38), for instance, from a humanistic perspective, critiqued the household model of exchange by Friedman (1953), pointing out that that exchange has been made to appear as a true voluntary action (i.e., individuals enter into it only if they stand to benefit). Accordingly, they argued that freedom in the market can be equated with the range of choices available. Thus, the more one can buy the freer one is, whereas true growth is growth in quality, up the hierarchy of human needs and values, and requires open options in the future because it is in the future that individuals may actualise their potentials. Following this reasoning, they maintained that the way individuals live rather than one's standard of living determines one's freedom. Hence, a sense of freedom is a 'state of being' rather than a 'state of having' (Lutz and Lux 1979:137). Therefore, ironically, as they argued, growth in production and inequality, can curtail people's freedom. It is worth noting that, in this argument, equality and other associated values, are seen as more important by individuals in their experience of freedom, because increases in production may even bring about destitution at the household level or greater inequality especially in view of limiting factors such as land and population increases.

Similarly, Boland (1982) argued that the processes of decision-making by the individual are often ignored by analysts schooled in theory. Thus, for cocoa households in PNG, and in their development context, the best way to gain an understanding of their economic decision-making and behaviour, is probably by starting from living realities. This is not to suggest an aversion for theoretical explanations, which would be just as absurd. The idea is that an unnecessary imposition of theory by an analyst on the rural cocoa farmers living in their socio-economic context, may not necessarily contribute to a better understanding of their economic behaviour and decision-making. This is because a theoretical understanding based on a deductive approach is reasoned from intellectually conceived and deduced principles, which applies its own logic of action and choice (Section 2.1, p.10, 13-4, 15-6).

In rural PNG market principles of supply and demand as well as non-market principles such as gift-giving and reciprocity operate side-by-side. Gift exchange and market exchange are said to be complementary (see for instance Schrader 1995, *On Money, Credit and Interest in Social Science*). Conventionally, a gift occurs where something is given in expectation of future reciprocation or, as stated by Schrader (1995), it is also an inter-temporal aspect of peoples' lives, carrying obligations and claims in the context of relationships. Similarly, I have also found the general argument by Godbout (1998), to be enlightening in terms of the context of rural cocoa economies in PNG. Gift-giving, as he stated, creates obligations to reciprocate and form social ties, which are beyond the impersonal ties of a commercial economy (for a critique relating to this argument concerning emphasis on spiritual aspects of gifts in relation to rights and obligations, see Signaud 2002: 335-358). By means of gifting, people and groups create, vary and maintain relationships among themselves while, in societies lacking markets and a system of money, gift-giving is likely to be the chief mechanism of redistribution. Further, he argued that, although it may seem irrelevant today, gifts tend to be all-pervasive, pointing out that, contrary to the assumption that modern societies function on the basis of market exchange and the pursuit of self-interest, the gift still constitutes a foundation of our social fabric. As he argued, a gift is not an object, but a social connection, in that it creates an obligation to respond in kind.

Overview of PNG Cocoa Smallholder Literature

In many developing countries such as PNG, if the producers' incentives to increase production are not affected, technical or institutional improvements will not have much success (Hodder 1980: 164-170). In PNG, it is now widely acknowledged that there is a need for the development and expansion of local markets as a way of increasing production for agricultural crops instead of placing emphasis merely on the need to increase production per se (e.g., Fleming and Kanappiran 1999; Fleming, pers. comm., 22 July 2005). Nevertheless, market efficiency itself may not necessarily increase smallholder cocoa productivity, which highlights a need to consider the local level factors influencing economic relations (e.g., Curry 1999; Curry & Koczberski 2004). Smallholder cocoa farmers have competing claims on

their time from tending alternative crops to socio-cultural obligations. Thus they use time in a manner that befits their daily activities. Because this reflects their lifestyle and priorities, it would be irresponsible for schemes aimed at improving productivity and rural livelihoods to ignore this reality. Precisely which goals take precedence in a farmer's life are difficult to predict. However, it is true, as Curry (1999; see also Connell 1997) indicated, that at times in PNG, farmers tend to subordinate economic goals to social ends, depending on their individual household circumstances.

PNG's Rural Economy and the Free Market Economy

Although PNG is a culturally diverse country, similarities also abound. A typical feature of PNG societies (see for example Banks 2004; Curry 1999, 2003, 2005a; Koczberski and Curry 2004), now increasingly being taken into account in the context of resource developments in the country, concerns the connection between land, identity/self and relationships. For instance, Koczberski and Curry (2004: 369) noted:

...social relationships are rooted in indigenous mechanisms of group exchange and identity formations, which facilitate social inclusion and enhance tenure security. Such transactions are outside the market economy and Western notions of land as a commodity...

Land is generally used according to people's various customary land use rights (Chapter 5, pp.78-9) and, accordingly, peoples' social, economic and political lives are intertwined with the network of relationships connected with their land. Economics, though an important part of rural Papua New Guineans' lives, had always formed only one part of the total reality of their lives. In western societies, as indicated in Bastiat ([1853] 1990), an individual is seen as a repository of certain God-ordained, inalienable rights, notably individual liberty, economic initiative and the right to private property. It follows that the free market economic system, by definition, is an economic system that follows logically from an individual's right to private property, economic initiative, and free trade (see also DiLorenzo 2000).

In contrast, PNG indigenous socio-cultural and economic reality is not ordered to a market system that asserts the primacy and autonomy of the individual (related to this, see Curry 1999: 285-298). In this reality people maintain their relationships by fulfilling social obligations or by adhering to culturally prescribed principles such as reciprocity and gift exchange (pp.22-3). These principles are part of the dynamic reality of smallholder life, which, in one way or another, influences their choices because their economic activities take place within their culture (LiPuma 1999: 192-213). It is easy to view such realities as contingencies in the process of economic development, perhaps, due more to the taken-for-granted presupposition that social relations become progressively commoditised as the economic becomes disembedded from the social and cultural. However, this is not necessarily the case, and the resilience of indigenous cultural values and economic practices is being recognised more widely (e.g., Curry 1999; Horan 2002: 205-221; James 2002: 269-292).

As Curry (1999; 2005a; 2005b) argued, the emergence of capitalistic trends of production in PNG is enmeshed in the interplay of social and market relations which are not easily separated, a reality that also helps explain why rural cocoa farmers re-invest so little of their cocoa incomes in block maintenance.

The Context of Production Efficiency in Relation to PNG Smallholder Cocoa Households

Tomer's (1999; see also Shubik 1961; Schenk 1997-98; 2002) socio-economic critique of productivity and efficiency based on neoclassical theory is relevant for understanding the application of production efficiency analysis and its underlying assumptions in relation to the socio-economic realities of rural cocoa producers, as typified by PNG's cocoa sector.

In a conventional production function, the potential/maximum output is determined by factor or input endowments such as land, tangible capital, labour, education and technology (i.e., maximum production efficiency implies maximum output from maximum investment) (e.g., Basanta *et al.* 2000; Farrell 1959; Tomer 1999). Typically, actual output is much less than potential. This output gap reflects internal inefficiencies in firms (X-inefficiency). This comes from slack in

production, which reflects such things as low worker effort and best business practices not being used (Tomer 1999: 2-3). Thus, actual output is explained by both the factor endowments and the degrees of inefficiency. Therefore, if there were no inefficiency, the actual output produced from the factors of production would equal the potential output.

The above explanation of production efficiency by Tomer (1999) posits profit maximisation according to the traditional orthodox economic teaching of the social function of a firm. This in turn presupposes economic efficiency. Therefore, a farmer cannot have economic efficiency unless he is motivated by profits (see also Boland 1982; Rowcroft 1979). Further, as discussed above, rationality is a measure of efficiency concerned with a relationship of means to an end. It is along this line of reasoning that it becomes important for the cocoa industry to recognise that attempts to increase productivity and economic efficiency may warrant considering broader contextual realities from a socio-economic perspective as Tomer (1999) argued. In addition, factors that might be contributory causes to farmers' inefficiency or low productivity have not been ascertained comprehensively. This is especially so given that, conventionally, economic efficiency requires specialisation (Wonnacott and Wonnacott 1990: 339), which smallholder households in PNG do not seek, although extension approaches to improving their lives tend to treat them as if they did.

The general premises of Tomer's (1999) argument are not new. Tomer (1999) argued that farmers are socio-economic entities because they are partially embedded in society (i.e., they respond in part to economic incentives and to social influences). Firms respond to the expectation of profits but also, he argued, as in Etzioni's (1999) communitarianism, they act in accord with moral values, commitments to community, and other social bonds that influence the web of socio-political relations in which individuals are involved. Thus, while the argument that firms can be constrained by social relationships means that the reverse can be true, when firms invest wisely in organisational (or social) capital, they can improve both their social responsibility and productivity.

Changes in the Social Bases of Production

While arguments about ways of improving productivity conventionally revolve around soil fertility, disease, yields, infrastructure, costs, efficiency and competitive advantage, increasingly writers such as Leiter and Harding (2004: 113-130) argue, along the lines of the livelihood approach, that social factors such as group action, power, conflict, and state intervention are also important. Such arguments are based on the conception of production that stresses the social aspects of the labour process (e.g., Albert and Hahnel 1991) and are generally rooted in social concepts such as empowerment, land rights, equality, power relations, gender relations, property rights, and labour relations (e.g., International Food Policy Research Institute 2002). In this conception, which draws partly on the Marxian labour theory of value (Albert and Hahnel 1991; Meek 1973), social coordination and direction of human labour which occurs in the production process of any economy, becomes an important subject for economic analysis. This is relevant to PNG rural households where social factors can affect the deployment of labour in the production of cocoa. Unfortunately, according to Leiter and Harding (2004), despite its importance, such issues in relation to tropical export cash crops like cocoa have received little attention from social scientists.

It might be said that, if no profitable alternatives existed, if they were undisturbed by pests and diseases and with appropriate knowledge, smallholder households would have to put more effort into cocoa production in order to benefit from productivity gains. This is a market expectation attuned to a one-dimensional perspective of rural cash crop producers (e.g., Koczberski and Curry 2005). True, as for agricultural activities, labour is a basic input in household cocoa farming but its use is very flexible, because, traditionally, Papua New Guineans' use of labour is not narrowly driven by the logic of labour as a commodity. Labour, as it was in the past, is still being accessed and put to use in fulfilling all kinds of life sustaining customary and socio-cultural obligations in the community and in catering for subsistence activities. This implies a need to look at the social aspects of labour and the fact that such factors could also add, perhaps in a subsidiary role, to economic factors such as efficiency and price competition as the drivers behind variations in

cocoa productivity as Leiter and Harding (2004) have argued. In this sense, labour recruitment and management attains relevance at the smallholder level.

Transport and Marketing

Similarly, in terms of transport and marketing, studies from other countries, although more broadly focused, have been generally concerned with strategies of improving rural transport as a way of facilitating rural people's access to resources, goods and services, employment opportunities, markets, and valuable market information (e.g., Seddon 2000; see also *World Bank Technical Note on Rural Transport in Multi-Sectoral and Community Driven Projects 2003*; *World Bank Technical Paper on Improving Rural Mobility 2002*). Thus, the main theme in such studies was concerned with reducing poverty through improved access to transport services by addressing issues such as the affordability and reliability of transport services. Although it is recognised that demand for transport is a 'derived demand' (e.g., World Bank: 2003: 1; Leinbach 2003), no work on the role of social factors in transport and marketing has been done outside the neoclassical economic approaches.

Likewise, studies on smallholder transport and marketing in PNG (for coffee, see Kuimbakul and Gilling 1989; Yala *et al.* 1999; Overfield 1991; Livingstone 1994, 1989; Overfield and Irog 1992; for cocoa, see Yarbro and Nobel 1989; Ghodake *et al.* 1995; Omuru 2001a; George 1994; Omuru *et al.* 2001), have been largely concerned with improved accessibility to markets, notably roads, as a way of facilitating increased output by farmers.

The most recent study concerning market accessibility and its impact on output has been by Fleming and Omuru (2001a), involving cocoa producers in the Gazelle Peninsula of the East New Britain Province (ENBP). They found that accessibility has only a weak impact on cocoa output and pointed out that other factors as yet unaccounted for might have been responsible for the results.

2.4 Summary

To provide some conceptual understanding on the situation of farmers by way of presenting alternatives to the neoclassical framework, this chapter, first, reviewed the basic critiques of the neoclassical economic theory prominent in developed countries. It is argued that the affirmation of individualistic values which underpin neoclassical framework is not primarily the case in the context of smallholder cocoa farmers in PNG who still live in a much more socially embedded economy. The need to be profit oriented was also critiqued because this idea in neoclassical frameworks, assumes the smallholders' freedom of economic action but not their responsibilities and constraints. Then, several social theory ideas were discussed to throw some light on the lived social reality of the cocoa farmers. I argued that the social and the economic are closely interwoven in the situation of the farmers who are confronted with the circumstances of an evolving economy. Also, while acknowledging the importance of transport as a facilitator of access to participation in the market economy in terms of cash crop transportation, basic everyday needs, and quicker technological adoption rates, it was pointed out that cocoa smallholder behaviour is also influenced by the social embeddedness of economic action.

The next chapter discusses the world cocoa economy and PNG's place in the world production of cocoa. The chapter shows that, while cocoa is a market driven commodity, the strategies applied by smallholders in producing countries like PNG are mostly semi-subsistence oriented and are aligned to supporting household cash needs and livelihoods. The chapter argues that, while the PNG Cocoa Board helps maintain cocoa production and smallholder cocoa incomes through various industry mechanisms, it has yet to develop effective strategies to help smallholder cocoa farmers raise productivity, in a context where indigenous socio-cultural principles governing their lives operate in tandem with market principles.

CHAPTER 3: THE WORLD COCOA ECONOMY AND THE PNG COCOA INDUSTRY

3.0 Introduction

This chapter provides a brief overview of the global cocoa industry followed by a brief discussion of the cocoa industry in PNG. This situates the PNG cocoa industry in the world cocoa economy and reports on some of the economic and policy variables that have influenced trends in cocoa production and consumption since the 1970s. It is shown that the PNG industry shares common concerns with other developing countries about the need to raise smallholder productivity, given its importance as a source of export revenue, rural employment and income. Also, as in many developing countries, concerns about increasing and sustaining cocoa productivity revolve around improving tree stocks, rural infrastructure, provision of economic incentives for growers, and directly encouraging farmers to plant more cocoa trees for the sake of national development.

While smallholder cocoa productivity is affected by the precarious nature of the world cocoa market, farmers react differently to changes in prices according to the circumstances and situations in each producing country. This tends to challenge the sustainability of productivity increases and hence the profitability of farms, because of the diverse farming circumstances and socio-economic realities, which confront farmers, particularly those in the Third World. The situation is further complicated in many developing countries like PNG where socio-cultural factors, that often have a non-market dimension, influence farmers' decision-making processes. For instance, the PNG National Government's various agricultural support services, and provision of improved planting materials, have only been modestly successful in terms of helping cocoa smallholders to sustain productivity increases over time. This outcome draws attention to the potential relevance of socio-cultural factors in economic decision-making, which, hitherto, have received minor attention from researchers; but which can influence profit-driven productivity, and entrepreneurial management of farms.

3.1 Global Background

Cocoa is grown within 10 degrees latitude of the equator in more than 50 countries worldwide (Gray 2001; ICCO 2003). It is an important agricultural crop for countries like Ivory Coast, Cameroon, and the Dominican Republic, and is of regional importance to some newly industrialised countries in Latin America and South East Asia (Vingerhoets 1997a). An estimated 90% of all cocoa is produced by smallholder farmers who farm five ha or less (de Lattre-Gasquet *et al.* 1998: 423-434; ICCO 1999).

Smallholder cocoa productivity is low in most African countries, and highest in Indonesia-Sulawesi (Gilbert and Varagis 2003: 10-11). Based on cocoa smallholder productivity data provided by the ICCO (06 December 1999; see also *Trends in Global Supply and Demand for Cocoa*, EX/116/7 [20] 2003b), annual smallholder yields range from 200 kg/ha in Ecuador to 1,500 kg/ha in Indonesia. Ghana and Ivory Coast, which are considered relatively large producers, have annual yields of 300 kg/ha and 450 kg/ha respectively. Despite varying yield levels, the main producing countries increase market share mostly by increasing the area planted to cocoa (GRO-Cocoa 2005; <<http://www.treecrops.org/search>>). Although authors like Gilbert and Varagis (2003) reported that Asian cocoa producers have a high degree of specialisation and, therefore, higher yields, they cautioned that this may reflect a tradition of monoculture rather than economically motivated decisions, noting further that West African farmers tend to produce extensive subsistence crops to a value typically greater than cocoa cash crops often growing other food crops among cocoa trees. This situation is comparable to the PNG situation where smallholders earn supplementary incomes from food crop sales.

Supply Side Factors

The economic and natural factors which affect cocoa productivity, as reported in the ICCO Cocoa Bulletin (20 March 1998a), include: i) return on investment, ii) government schemes, iii) alternative crops, iv) pests and diseases, droughts and floods, v) yield (depending on age, type, distribution of planting materials, level of

management, and ability to resist disease), vi) environmental influences, and vii) costs of production.

Leaving aside natural disasters and environmental factors (beyond full human control), approximately 44% of global cocoa production is estimated to be lost to black pod disease (*pythophthora Sp.*) (McMahon and Purwantara 2004). Global stakeholders, including PNG, cooperate in combating biological constraints such as black pod by improving the genetic resistance to disease of planting materials. PNG, for instance, alongside Brazil, Ecuador, Malaysia, Nigeria, Ghana and Venezuela, has been involved in an ICCO project, "*Cocoa Germplasm Utilization and Conservation: a Global Approach 1998c.*" This project, executed by the International Plant Genetic Resource Institute (IPGRI), aimed at the development, improvement and distribution of improved pest and disease resistant varieties of cocoa planting materials which will produce good quality cocoa and achieve higher and sustainable production levels.

Efforts are also being made to improve cocoa bean quality to ensure better grower prices and quality for end users (consumers). One such project, titled, "*Project to Establish the Physical, Chemical and Organoleptic Parameters to Differentiate between Fine and Bulk Cocoa 2001 (1998b)*" (supervised by the ICCO), initiated by Ecuador and involving Trinidad and Tobago, Venezuela and PNG, has been conducted with the aim of developing capacity to differentiate adequately and objectively between 'fine and flavour' and 'bulk' cocoa (see endnote 3) thus improving the marketing of the product.

Main Producing Countries

Figure 3.1 shows the main cocoa producing countries. For many developing countries, cocoa is a primary income source for their rural populace and also a valuable source of export revenue for development purposes. Thus, the drive to expand production is always there, especially where smallholder comparative advantage (profitable alternatives) may be limited.

Cocoa Growing Countries

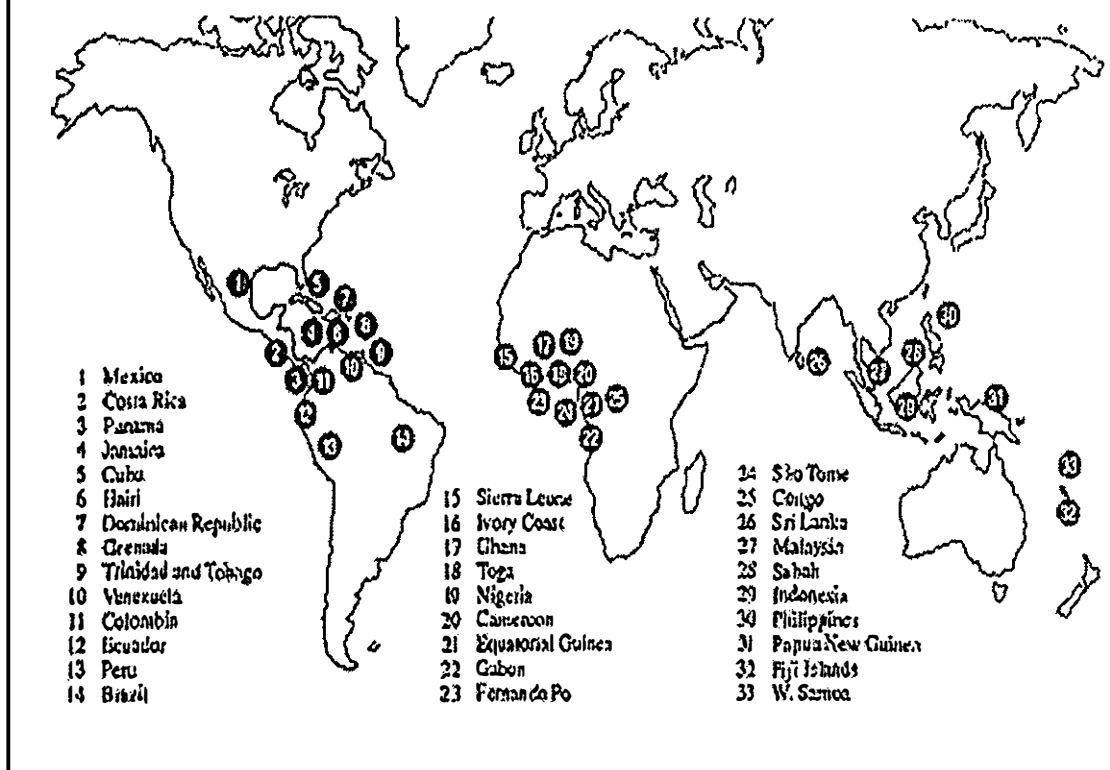


Figure 3.1: Main Cocoa Producers (Source: Cadbury Schweppes¹ 2002)

The main producing countries, except Malaysia (Koo 1996: 32-37), are all intent upon increasing cocoa output from current levels in the near future. According to *The Public Ledger* (a German-based Commodity Magazine 2001/02), Indonesia, for example, aims to expand output by 2010, while Nigeria also aims to increase output by 100% to 320,000 tonnes. Ghana and Cameroon also plan to increase output, while Brazil appears to be successfully resuscitating its industry which had been ruined by witches broom disease (*Crinipellis perniciosa*) (ICCO Bulletin September 2003a).

Production of cocoa (Table 3.1) is concentrated in just three countries: Ivory Coast, Indonesia and Ghana, with over 60% of world output. PNG is a small producer of cocoa by comparison with its share normally in the range of 1-2% of world output (Lummani 2003). Most PNG cocoa is exported overseas due to the lack of a domestic market for cocoa products.

Table 3.1: Major Cocoa Producers' Market Share (Million Tonnes), as compared with that of PNG

Major Producers	Average	% Market Share	Main Producing Areas
1. Ivory Coast	1.20	40.0 %	Southwest Region
2. Ghana	0.34	11.3 %	Ashanti, Western Region
3. Indonesia	0.32	10.7 %	Sulawesi, Sumatra
4. Nigeria	0.16	5.4 %	Ondo, Cross River State
5. Brazil	0.16	5.3 %	Bahia, Rondia
6. Cameroon	0.13	4.2 %	Mungo
7. Malaysia	0.06	2.0 %	Sabah
Total	2.37	78.9 %	
Papua New Guinea	0.03	1.10 %	East New Britain, Bougainville
Rest of The world	0.60	20.0 %	
Grand Total World	3.00	100.0 %	

(Sources: Lummani (2003); ICCO Quarterly Bulletin of Cocoa Statistics, 29 (3) 2002-03)

The success of major producers (Ivory Coast, Ghana and Indonesia) in producing cocoa is attributed to their low costs of production, comparative advantage of cocoa over other competing crops within these countries, and their relative successes in limiting the incidence of disease (Gray 2001: 4). While cocoa planting and production increased rapidly in Indonesia and Malaysia over the last 20 years, due to low costs and high yields, Malaysia, however, reallocated 55% of the land formerly under cocoa production to oil palm cultivation in the last 10 years due to poor prices and attack by cocoa pod borer (*Conopomorpha cramerella*) (Lummani 2003). It is not easy for PNG to undertake such reallocation because cocoa is grown mainly by smallholders in small plots on customary land.

Total Cocoa Area and Yield

The decision to plant cocoa is affected by many socioeconomic factors including: a) expected cocoa prices, b) the cost of labour and all other inputs, plus the availability of transport and marketing services, c) government programs to encourage planting, such as subsidies or rural credit schemes, government marketing services, commodity stabilisation funds, research and extension services, d) the level of knowledge and commercialisation among a country's farmers, and e) the availability of suitable land for planting.

Yields from existing tree stocks are affected by: a) weather (e.g. excessive rain as in some parts of PNG like Buin and, drought, especially in West Africa), b) the level of maintenance and amount of inputs such as fertilisers (as prices fall, growers tend to use less inputs and yields fall), and c) research and extension services (as higher yielding and more pest and disease resistant trees are developed around the world).

Cocoa prices have an effect on production because falling prices usually lead to less maintenance and harvesting work and reduced chemical inputs (especially with growers who rely on relatively higher inputs such as chemicals and paid labour such as estate producers and the more commercially advanced farmers). However, as Yarbrow (1989) noted, it takes about a year before changes in prices are noticeable and this does not have a significant effect on total world supplies in comparison with demand.

In addition to these factors, the ICCO used to purchase surplus cocoa in order to support prices, but this has not been very effective. Similarly, an individual country can suspend its exports and temporarily stockpile its cocoa until prices recover as the Ivory Coast did in 1988 (Lummani 2003).

Figure 3.2 shows the world supply of cocoa. Compared with the growth in demand (Figure 3.3), growth in cocoa supply has been very irregular over the years. Each time there has been a production shortfall, and a consequent price rise, it has been followed several years later by over-production, and falling prices. Cocoa production has thus grown with jumps in 1984/85, 1988/89, 1995/96 and more recently in 2003/04.

Based on market forecasts by international tree crop commodity organisations (e.g., Gray 2001: 19-20; ICCO 2003b), cocoa supply could be around 3.8 million tonnes by 2010. Oversupply, as the Executive Director of ICCO (Vingerhoets 2005) pointed out, remains a continuing threat because many smallholder cocoa growers have no alternative crops to generate livelihoods.

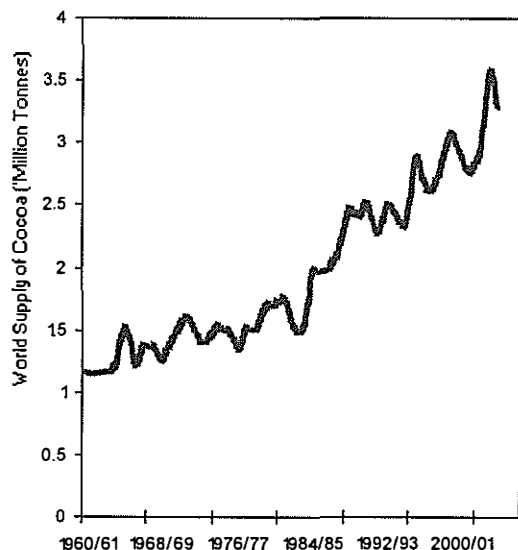


Figure 3.2: World Cocoa Supply in Millions of Tonnes: 1960/61–2004/05 {Sources: ICCO (1996) *Quarterly Bulletin of Cocoa Statistics* Vol. XXII; Landell Mills *Commodities (LMC)* 2000–2004}

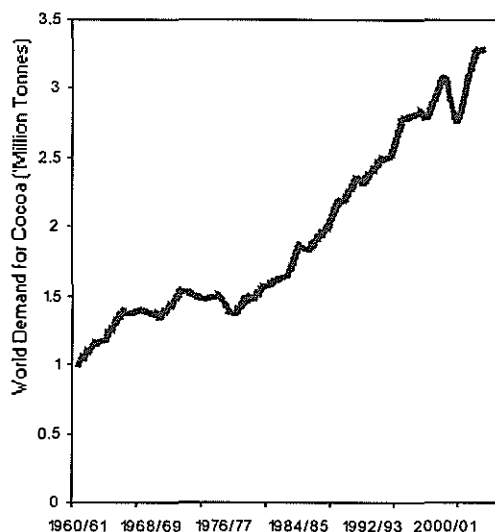


Figure 3.3: World Cocoa Demand in Millions of Tonnes: 1960–2004/05 {Sources: ICCO (1996) *Quarterly Bulletin of Cocoa Statistics* Vol. XXII; *LMC* 2000–04}

In an address to *The World Cocoa Economy: Perspectives on a Global Level*, in London, Vingerhoerts (1997a) highlighted the uncoordinated expansion of cocoa cultivation in some producing countries associated with government policies, citing what Brazil and Ivory Coast did in the late 1970s and early 1980s through officially-sponsored cocoa-development and rehabilitation programmes, most of which used modern hybrid planting material (this also occurred in Indonesia where cocoa was promoted as a means of economic growth and development in rural areas). Such uncoordinated expansion policies resulted in further increases in world cocoa supplies as the newly planted trees reached maturity. Growth in world demand for cocoa did not keep pace with supply resulting in structural surpluses and declining prices. Nevertheless, Vingerhoerts (1997a) noted that, perversely, individual countries could only maintain export revenues from cocoa through higher production levels, as the potential for additional gains in productivity and reductions in costs is limited. However, the global implications of such policies were further increases in world production leading to further declines in prices, thus pointing out the need for coordinated efforts among and within producing countries in terms of ensuring a measured increase in supply so as to keep prices from collapsing (Vingerhoerts 2005).

As with other export cash crops, the critical issues confronting cocoa producers are low prices, declining productivity, environmental concerns and labour constraints (ICCO Bulletin 2003b; GRO-Cocoa, Issue 8, December 2005). In fact, based on information from some industry stakeholders (e.g., Burger and Smith 2000a, 2000b, 2000c; Gray 2001; ICCO Bulletin 2003b; GRO-Cocoa, Issue 8, December 2005), a general decline in cocoa productivity is being witnessed in many parts of the world. This is mainly a result of persistent problems with cocoa disease in the humid tropics and a decline in the relative importance of estate production in countries such as PNG (Starbuck's *Cocoa Round Table Discussion*, 20 December 2004).

The natural and market risk factors make smallholder cocoa growers in PNG very risk-averse with little on-farm investment and negligible (if any) off-farm investments. This kind of behaviour also contributes to making long-term strategic investment decisions (which ultimately contribute to ensuring sustainable productivity gains over time) hard to undertake. Because smallholder producers, as in other tree crop commodity industries like palm oil and coffee, have no control over exogenous factors affecting supply and demand such as seasonality, weather, world prices, and consumption patterns in developed countries, these lead them to diversify income sources to maintain livelihood security, so that uncertainty seems to be a substantial basis for diversification, rather than being a strategic move in a business sense to take advantage of profitable opportunities associated with changing market conditions.

Similarly, changes in consumer tastes and purchasing patterns affect the demand for cocoa. As Gray (2001: 13) noted, countries with high GDP, notably European and North American are also high cocoa consumers. Few people in producing countries can afford to eat chocolate.

Western Europe and North America combined, consume around two thirds of global cocoa production (Gray 2001: 14; Lummani 2003). The largest consumers are the Netherlands, U.S.A and Germany. Because of relatively high per capita consumption of chocolate products in Europe and North America, consumption will

continue to grow with continued economic growth in these countries. New markets such as in Eastern Asia and Europe will be required to keep pace with the growth in production or prices will remain low.

Usually, global cocoa demand closely keeps pace with supply, currently at around three million tonnes. The overall growth in demand has been fairly smooth in comparison with the growth in supply (cf. Figures 3.2 and 3.3, p.35), growing by about 2.3% per year on average in the past 10 years (Vingerhoerts 1997a).

The demand for cocoa varies with the price of cocoa beans because producers of chocolate products use more or less cocoa per unit of final product (Burger and Smith 2000b), so that changes in the cocoa content of chocolate products would affect prices received by producers of cocoa beans in developing countries. But chocolate products rarely go down in price. These normally rise in line with inflation but are never reduced when cocoa prices fall on the world market. Producing countries, on the other hand, have no such price stability, and prices are unpredictable from year-to-year (Tanner 1990). In global terms, however, changes in income (GDP) have a larger effect on consumption (amount of chocolate bars produced) than changes in price (Dand 1999). For instance, according to ICCO (1993; see also Dand 1999), a 10% decrease in the price of cocoa in the U.S.A in the short term will result in a 1.99% rise in consumption, while a 10% increase in income would have double this effect; on a global scale, a 10% rise in income will increase consumption by 6.47%.

Generally, the reason why changes in cocoa prices have less influence on demand for cocoa than do changes in income in consuming countries is, because, unlike vegetable oil products, cocoa faces no trade barriers imposed by importers for protection of local production and has no close substitute (ICCO 2003b). Consequently, demand for cocoa tends to be less influenced by changes in price than are other commodities, so that any global increase in cocoa costs of production will result in reduction in supply, thus increasing the price of cocoa (Gray 2001). Therein, the future of cocoa globally (apart from demand in consuming countries), also depends on lowering production costs to make it possible to withstand international

competition, particularly for countries with a large share of total output from the estate sector such as Brazil and Malaysia.

The Market Prices for Cocoa

Figure 3.4 shows the historical world market prices for cocoa. Although it takes over a year for prices to have an impact on cocoa supply, small changes in supply can have an immediate and enormous impact on prices. For instance, severe droughts in 1983 in several cocoa-producing countries, especially in West Africa and Southeast Asia, and cold wet weather in Brazil resulted in a drop in world cocoa production by some 12% in the 1982/83 cocoa season and, the associated subsequent increase in price of about 24% in 1984.

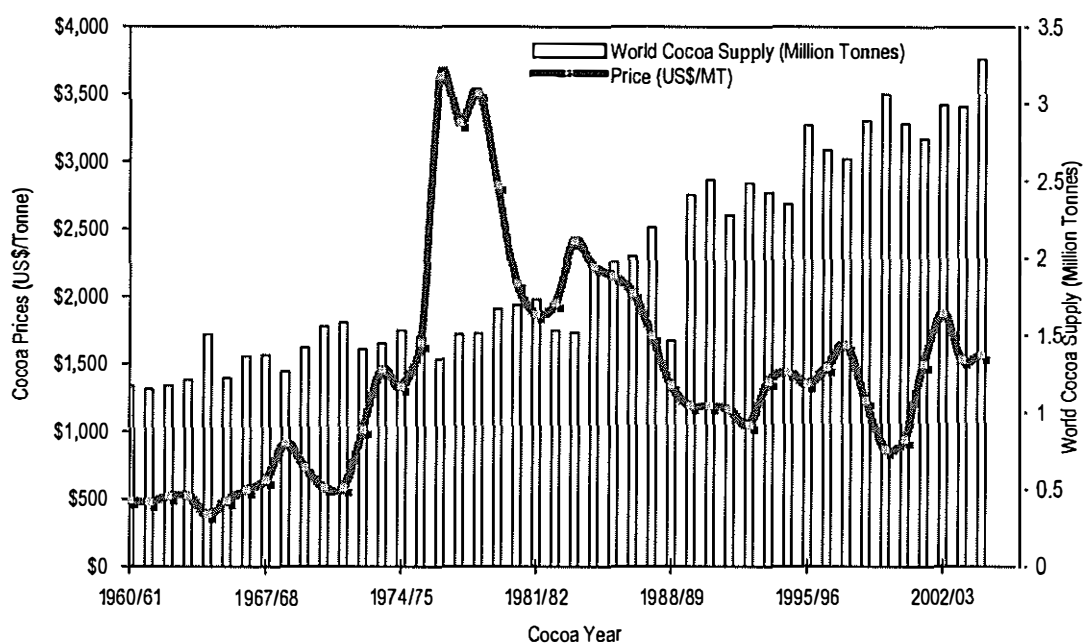


Figure 3.4: World Cocoa Prices in US\$/Tonne Versus World Cocoa Supply: 1960/61–2004/05 {Source: ICCO Quarterly Bulletin of Cocoa Statistics (1960 onwards), <http://www.icco.org/menustats.htm>}

The world market for cocoa is one of the most volatile markets for tropical commodities, exhibiting cyclical fluctuations in prices resulting from changes in stock levels (Vingerhoerts 1997a; ICCO 2003b). Farm-gate prices in PNG follow the trend in world prices, generally maintaining a share at between 50% and 80% of the

world price in most years (*PNG Cocoa Board Market Reports 2000-05*). World cocoa prices were higher in the 1970s, a period characterised by supply deficits, with prices reaching their highest level in 1976-77 (Figure 3.4), when world stocks reached their lowest. In the 1980s, structural surpluses lead to the opposite extreme, with prices dramatically falling to their lowest levels historically (since the early 1970s) in the early 1990s to around the US\$1,051/tonne level (Figure 3.4). The 1990s were generally characterised by supply deficits but prices did not recover by as much as expected, due to surplus stocks.

Burger and Smith (2000a: 3) reported that the volatility of producer prices is often less than the volatility of world market prices because of the price setting policies of marketing boards and other government bodies (for PNG, see Figures 3.5 and 3.6, pp.42, 44). From an economic perspective, it could be said that, on the one hand, farmers were protected to a certain extent from the volatility of prices but, on the other hand volatility was reinforced as supply hardly responded to price changes.

From the 1980s, the neoliberal outlook of the World Bank and IMF on the world economy has influenced many developing countries with many deregulating their marketing boards. The expected benefits from such actions have been rather contentious with some authors (e.g., Gilbert and Varagis 2004; Haque 2004; see also ICCO Bulletin September 2003a, July 1999), arguing that greater benefits could actually accrue to consumers in developed nations instead of farmers in producing countries. In this respect, liberalisation-related expansion in the aggregate supply of cocoa, in conjunction with its inelastic demand, could result in low world prices, thus benefiting consumers as a result of low cost intermediate and end products.

Some indication of the short to medium term future of the world cocoa market may be gained from Burger and Smith (2000a, 2000b; Gray 2001; ICCO Bulletin 2003b) who have projected an overall weaker growth in cocoa production capacity, at least until around 2010. They reported that, without substantial planting rather soon, the growth in production would be further reduced in later years. Similarly, Gray (2001) presented a somewhat similar outlook in two of three forecast scenarios. In summary, her three scenarios would have cocoa prices hovering in the

range US\$1,460-2,560/tonne by 2010, based on the projected demand and supply situation.

The main driving factors for the future situation pointed out by Burger and Smith (2000) were: i) the planting and abandonment of cocoa trees, ii) incomes in producing and consuming countries, and iii), the balance of demand and supply.

3.2 Overview of Commercial Agriculture and Cocoa Production in PNG

As in most developing countries, PNG's agriculture sector is, for the majority of the population, the foundation of its economy with the potential to increase standards of living and to absorb an ever increasing labour force. The development objectives of the sector (*White Paper on Agriculture, 1996-2000*) emphasise: diversifying and increasing agricultural exports; reducing imports of food; increasing productive employment; and improving the incomes and living standards of the rural populace.

The government aims to achieve these objectives by: stimulating growth in the smallholder and plantation sectors; expanding export and import substitution crops based on international comparative advantage; improving marketing of agricultural produce; providing financial and management assistance to PNG nationals to enable them to assume responsibility for previously expatriate owned and managed plantations; delegating responsibilities to provincial governments for major development works; and increasing the involvement of the private sector in the development process.

The PNG government maintains an open economy with an emphasis on private initiatives and free trade. There is very little intervention by the government in the marketing and pricing of agricultural inputs and outputs except for some producer financed price stabilisation policies in certain industries. Agricultural exports were subject to a standard 2.5% tax [free-on-board (f.o.b) basis] (unchanged) applicable to all exports, while commodities consumed domestically used to be almost entirely free of government intervention but now include VAT taxes. The agricultural infrastructure tax credit for improved agricultural activities has been

increased from 0.75% to 1% in the 2005 budget. Other incentives include a 150% tax reduction for approved agricultural research and development infrastructure (Budget 2002, Volume 1: 41).

Commercial agriculture in PNG is dominated by the tree crops sub-sector which accounts for a significant proportion of the value of agricultural output. In this, the government follows a policy of cost recovery in all agricultural development projects and finances all field development and settlement costs through credit provided by the Agriculture Bank of Papua New Guinea (ABPNG). In certain instances, the government encourages investment by the private sector in agricultural projects; at times it invests its own resources to provide impetus or risk-sharing incentives or both to private investors. In such cases, project management is always in the hands of the private sector. The government's role in the agriculture sector is limited to the provision of agricultural support services such as agricultural research, extension, credit, and rural infrastructure, with an emphasis on increased productivity of smallholders and plantations through the provision of inputs, support infrastructure, sector-specific technology and access to credit (Budget 2002, Volume 1: 41)

3.3 The PNG Cocoa Industry

The total area of PNG is approximately 46 million ha, of which 30% is considered suitable for agriculture (ADB Study 1987). Only 50% of the arable area (7,500,000 ha) is under agricultural production, including 476,000 ha under tree crops (Table 3.2).

Table 3.2: Land Cultivation under Export Tree Crops

Export Tree Crop	Hectares Planted	% of Total Area Under Tree Crops
Coffee	47,600	10
Palm oil	28,560	6
Cocoa	128,520	27
Coconut	261,800	55
Rubber and Tea	9,520	2

{Source: ADB Study (1987)}

Approximately 825,000 ha of land are rated as highly suitable for cocoa production, but the estimated planted area in 1987 was 128,520 ha (Table 3.2). Cocoa plantations occupied some 54,550 ha in 1978 (Bridgland 1981). The number of cocoa growing households has grown rapidly. Some 70,000 coastal households were cultivating approximately 65,000 ha of cocoa in 1980 (1980 Census). This grew by 33% to 93,000 households in 1990 (1990 census), and by 62% to 151,000 households in 2000 (The 2000 National Census). These figures reflect an average growth of about 3% between 1980 and 1990, and 6% between 1990 and 2000.

Cocoa is grown in 13 coastal provinces either as a mono-crop or intercropped with coconuts or food crops. Rural households produce two thirds of national cocoa output annually, while the plantation sector produces the rest. The plantation contribution to total production has been declining over time (Figure 3.5).

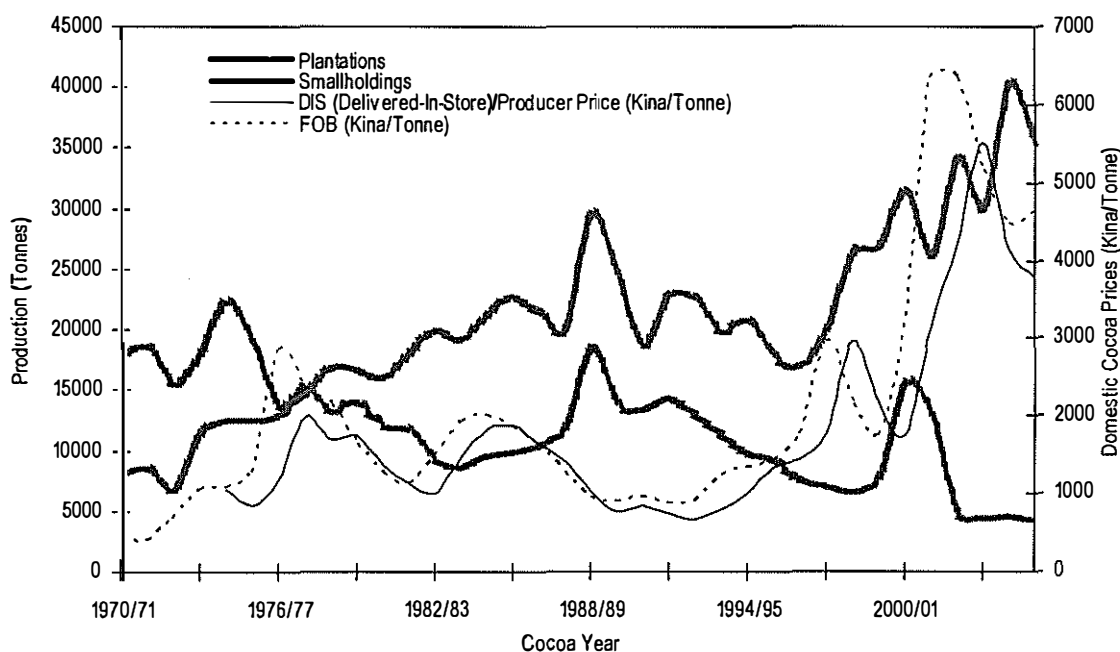


Figure 3.5: PNG Cocoa Production by Sector Versus Bounty/Levy Adjusted Domestic Prices (Kina/Tonne): 1970/71-2005/06 (Source: PNG Cocoa Board)

Domestic Cocoa Production

Bougainville produced about 49% of PNG's cocoa before the Civil War, East New Britain (31%), Madang (6%), East Sepik (5%), and the other cocoa producing provinces (9%). East New Britain is currently the major producer. In relation to the three main regions within the country, cocoa production is concentrated in the Islands region (84%), Momase (14%), and Papuan Region (2%) (Lummani 2003).

Cocoa production on Bougainville has picked up rapidly since the end of the Civil War in 1996. According to the PNG Cocoa Board Quarterly Market Reports (2005), production reached 7,236 tonnes in 2004 and over 10,000 tonnes in 2005. The PNG Cocoa Board expects production from Bougainville to soon reach its pre-civil war level of 18,000 tonnes in the near future, probably by 2010. Furthermore, there is evidence that cocoa cropping has contributed to strengthening the peace process by engaging people in income-generating activities to sustain their livelihoods and increase rural employment (UNDP, *The Courier ACP-EU, Focus*, July-August 2001).

Cocoa was introduced to PNG by German settlers around 1905, but production levels remained low until the 1950s when the Australian administration promoted the crop on land settlement schemes and among village smallholders. Prior to 1950, it was mainly a plantation crop grown by expatriates, mainly Europeans. Between 1974/75 and 1984/85, plantation production declined by 52% but this was substantially compensated for by a near doubling of smallholder production in the 1985/86 crop season (Figure 3.5).

Production in both sectors increased during the 1999/00 crop season partly due to increases in yield from improved varieties of cocoa: these are the SG2 modified hybrid cocoa planting materials (big and small) and the cocoa hybrid clones, distributed during the last eight years by PNG CCI (Omuru *et al.* 2001). The contribution from the plantation sector, however, has fallen in absolute terms and has declined relative to smallholder production.

The main reasons for the decline in plantation sector production were land tenure uncertainties and low commodity prices (especially between 1979 and 1982), coupled with high production costs and lack of production from Bougainville which accounted for about 36% of total plantation production prior to the Civil War. From the mid-1980s to date, smallholders have accounted for about 67-70% of national cocoa output.

The price received by cocoa farmers is one of the factors which has a direct influence on the rate of increase in production and which can readily be influenced by governments. There are two broad types of farmer price systems. A 'free-market system' has long been present in the cocoa producing regions of the Americas and Asia, while a 'marketing board system' with prices heavily influenced by governments was more common in Africa (Vingerhoerts 1997a). PNG has used the former with the National Cocoa Board mainly exercising a regulatory role over the industry concerning quality aspects and farm income stability through price and income stabilisation policies. In the free-market system, domestic cocoa prices move in line with movements in international f.o.b prices (Figure 3.4, p.38). Figure 3.6 shows the total cocoa output in PNG and the domestic producer prices supported by the government in periods of low prices in order to cushion the impact of world price fluctuations on domestic farmers (see pp.49-51).

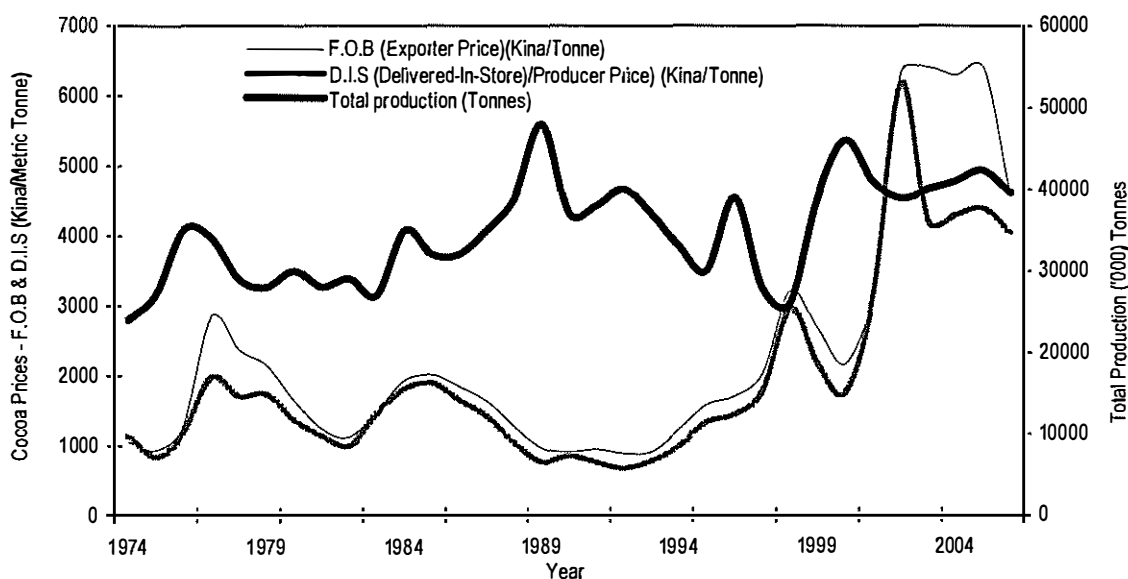


Figure 3.6: Total Cocoa Production Versus Domestic Cocoa Prices (Kina Per Tonne): 1974-2006

{Source: PNG Cocoa Board}

National output of cocoa averaged 32,000 tonnes in the 1980s, restrained by drought in a number of cocoa growing areas. Since then production increased substantially, reaching 48,000 tonnes in 1989, but declined subsequently, due to the Bougainville Civil War, and high rainfall in 1989 and 1990. Since 1985 cocoa prices have been declining steadily following a gradual build up in stocks due to excess production for the world market (Lummani 2003). In 1989/90, world prices fell as world production once again exceeded consumption, thus increasing stocks. A slowdown in production led to price increases. Since 1989 adjustments from the Cocoa Stabilisation Fund (CSF) and support from government loans have helped to contain sharp fluctuations in domestic prices and sustain domestic production (Figure 3.6). Speculative buying enhanced by anticipated supply shortages had been driving cocoa prices upward prior to the rebellion in Ivory Coast in September 2002, and, according to PNG Cocoa Board Market Reports (2002-03), about 80% of the increase in f.o.b price has been passed onto smallholders.

Smallholder Cocoa Cultivation

Cocoa farming households in PNG cultivate an average of about 1.5 to 2.5 ha of cocoa, usually intercropped with coconut palms (Godyn 1974a; Yarbrow and Noble 1989; George 1994, Ghodake *et al.* 1995; Cocoa and Coconut Extension Agency 1999; Omuru *et al.* 2001). The typical planting density is 625 trees/ha at 4 x 4 metre spacing (Omuru *et al.* 2001).

Generally, yield information in PNG is sparse for both smallholders and plantations. Table 3.3 shows the average smallholder cocoa yield/ha for dried beans derived from major studies involving smallholders (Godyn 1974a; Yarbrow and Noble 1989; George 1994; Omuru *et al.* 2001; Omuru 2001b).

Table 3.3: Smallholder Cocoa Yield of Dry Bean in Tonnes Per Hectare

Area Surveyed	1974	1989	1994	1998	1999
Gazelle Peninsula	0.296	0.320	0.356	0.401	0.620 *
North Solomons	0.332	n.a	n.a	n.a	n.a
Madang (North Coast Road)	0.250	0.100	"	"	"
Madang (Karkar)	n.a	0.080	"	"	"
ESP	"	0.170	"	"	"
Oro	"	0.320	"	"	"

{Note: 1) for the localities within PNG shown on the Table, see Figure 5.1, Chapter 5, p.73, (2) n.a=not available; (3) * this figure is relatively higher because the survey (i.e., Omuru *et al.* 2001) which recorded it was conducted during a peak period of previously released hybrid clones}

Plantation yields, as for other cash crops such as oil palm are higher than smallholder yields (Table 3.4), but has also been constrained by the factors noted in Section 3.3 (p.44).

Table 3.4: Yield of Cocoa Plantations in PNG in Tonnes Per Hectare Per Year

Year	1989	1990	1992	1993	1995	1996	1997	1998
DB/Ha	0.92	0.63	0.90	0.53	0.49	0.59	0.38	0.52

{Sources: Fripp 1996; Azdec Limited Consultants sighted in Fripp 1996; Omuru 1997; Omuru and Lummani 2001}

Results from the regression model by Milne *et al.* (1999), have shown that increases in production in the 1990s, were actually due to increased hectareage planted to cocoa rather than a response to increases in cocoa prices. This, in part, was due to the availability of surplus land for planting cocoa trees in most cocoa producing provinces, to meet rising household cash needs. However, generally poor farm conditions have often been perceived as the cause of low smallholder yields relative to plantations. Although planting materials such as the hybrid clones have the potential to produce well over one tonne/ha, it is uncertain whether smallholders can produce at this level because of their low labour input in block maintenance (Curry, Koczberski, Omuru and Nailina 2007). In addition, concerns could legitimately be raised about whether smallholders are more concerned with maximising profits from cocoa production, or, are more concerned with sustainability of yields and thus incomes over the longer term because of their growing cash needs.

Smallholder Cocoa Production Costs

Table 3.5 shows the cost of labour inputs employed in the process of smallholder cocoa production. Labour is the main input in most production activities.

In a report profiling smallholder yields and costs in East New Britain Province, Omuru (2001b: 7-9, 19) reported the cost of production/tonne as K578.36 in 1999. Transport costs K182.66 were a major component, followed by “sundries” K130.89. Other costs were processing K101.91, harvesting K84.81, and field variable costs K78.10.

Table 3.5: Labour Input and Cost of Production for Cocoa in Kina Per Tonne

Province	Labour Days/Tonne (Wet Beans)	Kina/Tonne (Wet Beans)	Labour Days/Tonne (Dry Beans)	Kina/Tonne (Dry Beans)
ENB	152	101	221	362
ESP	202	100	279	451
Karkar (Madang)	n.a	174	n.a	n.a
Madang (NCR)	300	245	481	1,144
Oro	131	64	218	429

(Source: Yarbro and Noble (1989); * inflated cost due to low yields coupled with high capital costs (see p. 52). Note: n.a=not available)

Generally, smallholders use very few inputs including block maintenance labour, and are able to get good returns from their cocoa even at low prices in contrast to the plantations. When cocoa prices rose from mid-2001 until the end of 2002, smallholders were more than breaking even. Cocoa statistics (1990-2002) from the PNG Cocoa Board, for instance, indicate an average d.i.s price (grower price) of about K8,088/tonne in January 2003. Based on the production cost of K578.36², smallholders, at the time, were doing well with an average net income of K7,510/tonne.

However, reinvestment into cocoa farms is very low (Omuru *et al.* 2001). Many farmers, as noted in the introduction (Chapter 1, pp.4-5), do not reinvest profits in farm maintenance. Also, as noted in the introduction, this is due, in part, to a strong preference towards consumption spending and investment of incomes in

traditional exchange networks rather than reinvestment of profits in agricultural enterprises (preferential illiquidity).

Smallholder Annual Incomes from Cocoa Production and Expenditures

Lack of up-to-date smallholder surveys in cocoa growing provinces hinders gaining an adequate overall picture of village grower's cocoa incomes by province. Nevertheless, a few studies undertaken in ENBP have provided some light in this regard. George (1994), for instance, recorded an average annual cocoa income of K2,700 from smallholder cocoa growers in ENBP. The latest survey by Omuru *et al.* (2001) reported an average annual cocoa household income of K2,800. Smallholder cocoa farmers use their incomes from cocoa to meet the costs of education for their children, tradestore foods and socio-cultural obligations, but the range of income earning activities in terms of alternative tree-cash-crops other than cocoa is limited (Lummani 2001). According to George (1994), annual household expenditure in ENBP was K1,254. This could have increased to some extent in the last eleven years because of inflation and the devaluation of the PNG Kina which increased the costs of items that cocoa farming households in the Gazelle Peninsula (ENBP) depend on (Lummani 2001).

Marketing of Cocoa

Growers can either sell wet beans to dealers registered with the PNG Cocoa Board or process their cocoa into dried beans and sell them to a registered exporter. Almost all plantations have fermentaries and sell only dried beans to exporters. In the early days of smallholder production, most smallholders sold their cocoa in wet bean form to dealers. However, as Yarbrow (1989) noted, smallholders have increasingly processed their own cocoa for sale over the years. The PNG Cocoa Board now allows smallholder dealers to buy dry beans. Processing wet into dry beans provides growers with better returns.

The number of registered fermentaries has grown since the late 1970s but fell during 1989-90 due to the Bougainville Civil War. Ninety per cent of fermentaries are owned by smallholders, particularly in the two major growing provinces, East

New Britain and Bougainville (prior to the Civil War) (Yarbro 1989). There were 2,196 registered fermentaries in February 1990, of which 47% were also dealers (Ivarami and Yarbro 1992). By end of January 2003, PNG Cocoa Board records showed there were 4,546 fermentaries, an increase of 107% over 1990 (Table 3.6), of which 46% were also wet bean dealers.

Ivarami and Yarbro (1992) reported that in 1989/90, ten companies were registered to export cocoa. This number has since doubled and, during 2003, about 20 registered companies were exporting cocoa from the various ports around the country (Lummani 2003). Nevertheless, smallholders are mostly not directly involved in the marketing chain of the export trade. They have mostly developed linkages with export agents.

Table 3.6: Registered Fermentaries and Dealers as at 31 January 2003

Province	Total Fermentaries	Total Dealers
North Solomons	842	161
East New Britain	2,507	1,010
New Ireland	161	137
Madang	442	302
West New Britain	102	65
Morobe	68	39
Manus	11	8
Oro	36	20
East Sepik	304	275
Sandaun	64	60
Milne Bay	8	4
Central	1	1
Gulf	-	-
Total	4,546	2,082

{Source: PNG Cocoa Board (2003)}

The Operation of the Cocoa Stabilisation Fund (CSF) Scheme

Table 3.7 shows the operating level of the CSF since its inception in 1974. The Fund is administered by the PNG Cocoa Board. The initial aim of the Fund was to stabilise producers' income based upon an average industry cost of production. However, following a major review of stabilisation schemes by Wheeler and Wyatt (1978), price stabilisation was adopted in favor of income stabilisation. The formula was then changed to stabilising prices around a 10-year moving average of export prices

upon which the threshold price was estimated. Until May 1989, it was financed entirely by levies on producers and interest income.

Table 3.7: The Cocoa Stabilisation Fund ('Million Kina'): 1975-2005

Year	CSF	Year	CSF	Year	CSF	Year	CSF
1975	0.4	1985	46	1995	-	2004	6
1976	4.4	1986	47.1	1996	3	2005	2
1977	32.3	1987	40.5	1997	2.6		
1978	48.9	1988	29.6	1998	2.7		
1979	60.2	1989	10.8	1999	7.7		
1980	61.9	1990	-	2000	-		
1981	53.7	1991	-	2001	-		
1982	44.7	1992	-	2002	4.4		
1983	44.9	1993	-	2003	-		
1984	-	1994	-	1996	3		

{Source: 1975—1986 from Guest, J. (1987, Table 1:17); 1987—1989 (BPNG QEB, June 1988, Vol. XVI, No. 2); 1989-2005 (BPNG QEB, December Issue (1990), March Issue (2005) Note; - = none}

The scheme is governed by a formula agreed upon by the PNG Cocoa Board, the growers and the government. The system of payment of the cocoa bounty and the collection of the levy is based on the marketing arrangement of the cocoa industry. A cocoa levy is charged at times of moderate to high prices, which is then held in CSF deposits with the Bank of Papua New Guinea (BPNG) and commercial banks. A bounty is paid to support the price paid to cocoa producers when prices fall below an official industry set limit.

However, the Cocoa Board has raised concerns in the past that the bounties do not reach producers in full due to price manipulation by exporters. However, analysis by Guest (1987) as reported in Gumoi (n.d), indicated that bounties in the cocoa industry have been passed in full to the producer level. In a later analysis, Gumoi (1992), found inconclusive evidence concerning the extent to which bounties and subsidies have been passed from exporters to producers, but other analysts (e.g., SRI International 1990; Overfield 1991; Guest 1989; Simmons and Yarbro 1993 cited in Fleming and Milne 1999), have found strong evidence that bounties were not absorbed by marketing agents. However, evidence to the contrary also exists as Omuru (*Internal Seminar*, PNG CCI 2002) pointed out. Companies with larger

export quantities of dried beans continue to benefit more in terms of the crop value and bounty payments than do smallholders.

The success of the cocoa stabilisation scheme has been debated in the past. The cocoa stabilisation scheme seems to have been more successful in stabilising f.o.b export prices as compared with the coffee and copra schemes. Guest (1987) found that stabilisation policies have reduced the degree of instability in f.o.b cocoa prices by 46%, followed by copra at 43%, and coffee at 32%.

In summary, the cocoa stabilisation scheme has, in general, helped to maintain the welfare of farmers in times of depressed commodity prices. However, in the new liberal environment associated with deregulation of commodity boards in developing countries, producer prices will be directly linked to world prices by competitive market structures, increasing the income risks faced by smallholder growers, especially those relying on a single tree crop. However, many PNG smallholder cocoa producers, including Buin farmers, rely on mixed farming, notably combining cocoa and coconut farming with food crops and other commercial agricultural and non-agricultural types of enterprises. These types of farming systems are better able to cope with the ups and downs of the new riskier market environment. They also suggest lessons for the design of new systems to meet the needs of the rural poor.

3.4 The International Cocoa Agreement

PNG has been a member of the ICCO since its establishment in 1972. The ICCO has operated under the Fourth Agreement since January 1987, whose major objective has been to stabilise cocoa prices by purchasing and storing cocoa in ICCO buffer stocks when prices are low and selling cocoa from its stockpile when prices are high and supplies are short. The new Agreement, reviewed in 2001, which PNG acceded to, allows major exporting countries to stockpile cocoa within their borders at the ICCO's expense to support prices in line with the ICCO mandate to work on projects and programmes to achieve a sustainable cocoa economy and to encourage greater participation of the private sector in the work of the organisation (*The World Cocoa Directory*, ICCO *Annual Report*, <http://www.icco.org>).

As a reward for joining the ICCO in 1973, PNG was awarded “fine or flavour”³ status for 75% of its production. Fine or flavour beans are exempted from the ICCO levy of US\$30/tonne. Therefore, until 1993, PNG was paying a levy on only 25% of its exports which total about US\$250,000/year and which was paid out of the CSF. The fine or flavour status was based on FAO research in PNG in the late 1960s before the widespread planting and replacement of Trinitario with Amazonian-Trinitario crosses. The status originally accorded to PNG’s cocoa production was reduced to 25% only in 1993.

Nevertheless, the market views PNG’s cocoa as good quality “bulk” cocoa. Its butter content is good at about 56% of bean weight. The butter has strong taste, dark colour and relative hardness, and the beans are consistently large with bean weight exceeding one gram. However, its shell content is high at about 17%, compared to about 11% for Ghana’s cocoa. Since the shell is a waste product, a higher shell content means higher production costs for the chocolate manufacturer. Manufacturers have also found some of PNG’s cocoa to be poorly fermented and smoke tainted. PNG’s cocoa trades at a £50/tonne discount on the London International Finance and Futures Exchange (Liffe Non-Financial Products, Cocoa Summary 2002).

3.5 Summary

PNG shares similar concerns with other cocoa growing countries regarding smallholder cocoa productivity. Like most other developing countries, the main feature of PNG cocoa production is its small sized farms, where cocoa production is coupled with income supplementary activities, particularly food crop sales, with some cash crop diversification occurring, especially into balsa (*Ochroma lagopus*) and vanilla (*vanilla planifolia*; *vanilla tahitensis*). There is low smallholder cocoa productivity/ha, compared with plantations but their export share is higher.

The cultivation of cocoa on customary land in PNG is also one of its features. There is no general trend for PNG farmers to leave the land. It is the case that, although the young and better educated seek employment in cities, many return to their villages at a later stage. To the extent that farmers are facing low productivity,

arguably this is often a response to low prices relative to those obtainable from the sale of subsistence crops at local markets.⁴ In part, therefore, low productivity could be seen as a response to low prices. This raises the question of why PNG farmers generally have not been able to realise the productivity advances witnessed in Asia and in parts of Latin America. One answer to this is to suggest that the complexity of economic and social interactions in smallholder villages in PNG makes it more difficult for individual farmers to adopt entrepreneurial initiatives than is the case in other communities in Asia and Latin America. Although this may retard development, it provides employment and also maintains a relatively robust informal social security system.

More efficient production systems would almost certainly require less labour and, with PNG's population still growing and in the absence of employment opportunities in the industry and the services sectors, there are no major market pressures to convert customary land to more market-oriented production and individual land tenure regimes. In this sense, extensive smallholder production on relatively small farms does not currently appear under threat even though it is uncertain that it will generate major advances in productivity or rural living standards in the near future.

Overall, it is true that, given improved, agricultural policies, technology adoption rates and productivity, and agricultural research and extension services, PNG could increase output to a level comparable with producers like Malaysia in the short to medium term. In this respect, the national government is focused on interventions necessary to create the basic conditions for improving productivity such as investment in research, roads and extension services. Land reform as a way of facilitating commercial production is also seen by many as an important policy intervention to create conditions for growth (e.g., Hughes and Windybank 2005; Yala 2006; Fingleton ed. 2005; Curtin *et al.* 2003). The importance of input-output credit is also widely acknowledged in the view that once the basic conditions are in place, the uptake of productivity increasing technology is likely to be limited to farm households with better access to input-output markets.

However, this neo-liberal perspective is questionable in the PNG context. As will be argued in later chapters, PNG smallholders engage in cocoa production for more reasons than generating profits, and it cannot be assumed axiomatically that more individual land tenure regimes achieved through land reform and market-based incentives will lead to productivity increases.

In the next chapter I discuss my research methods and why I used a multi-method approach in my study. This is followed by a discussion on the advantages and disadvantages of my approach in relation to my research fieldwork.

CHAPTER 4: METHODS

4.0 Introduction

The study is based on 12 weeks of fieldwork in Buin district, South Bougainville, PNG, from 28 December 2004 to 26 March 2005. The fieldwork was conducted in Iamaru village within the Muguai sub-parish centred at Tabago Catholic Parish (Figure 4.1; see also sketch of the study site, Figure 5.3, Chapter 5, p.95).

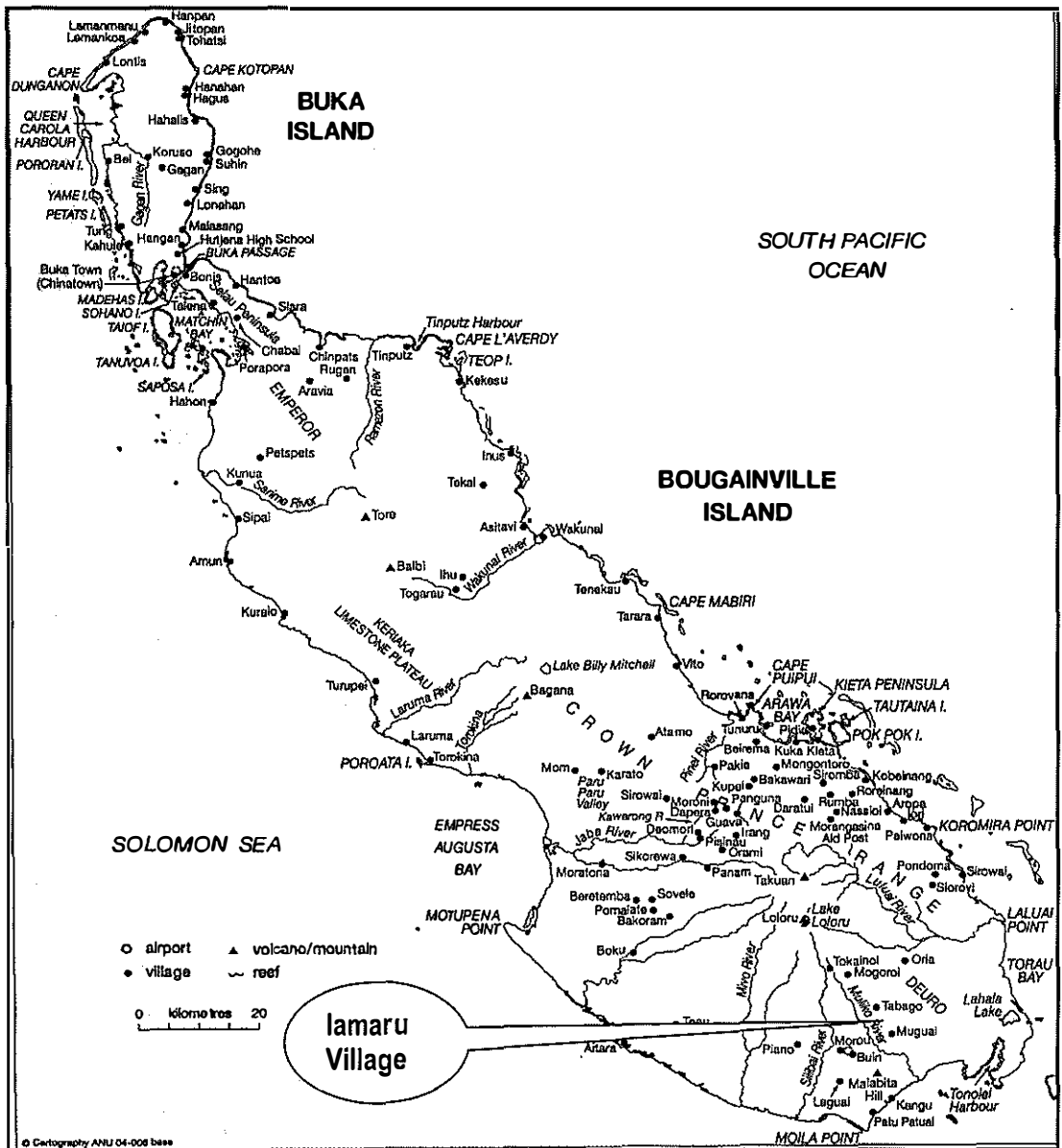


Figure 4.1: Map of Bougainville Showing Study Site, Iamaru Village (Muguai) (Source: Regan, A. & Griffin H.M. (eds.), 2005, p. xxvi)

Buin is a relatively remote area in which the Civil War situation has served to strengthen the dynamism of social solidarity values in terms of interpersonal and group cooperation and other forms of assistance, not only during the war but also, while emerging out of the war situation. The fall back on social safety networks in harsh circumstances, and the subordination of mere calculating individualism to social values proved to have been mutually beneficial to families affected by the war. The promotion of an extensive distribution of cocoa seedlings by AusAID and the UNDP, since 1996, also heightened social relationships among farmers lacking transport and processing facilities and, in fact, in the whole cocoa production process. And like most Melanesian societies, Buin cocoa farmers have been citizens of an evolving rural society since before the Civil War. This is characterised by a holistic conception of life: religious, social, political and economic, where social principles such as reciprocity and gift-giving formed the basis of societal life. Thus, it was an opportune site for fieldwork given the aims of the study, and also given that no smallholder study has been done there for many years.

4.1 Research Methods and Data Sources

There are approximately 50 households in Iamaru village with 5% of the population working or studying elsewhere. The majority of village families are largely self-sufficient farmers most of whom also engage in some export cash cropping.

Thirty six farming households were selected for the study. Farmers were called to a meeting (Plate 4.1), briefed about the purpose of the study, their rights and freedoms explained, asked for their voluntary participation, and consent forms were signed by those agreeing to participate in the research (Appendices 1-a and 1-b). Decisions about adjustments in the sample size and research process were made in an ongoing manner during the research in collaboration with my supervisor in light of possible practical difficulties and/or other considerations.



Plate 4.1: First Arrivals for the Briefing Session, 28 December 2004

Supplementary data were collected from other farmers not directly involved in the study, to canvass a wider range of views of the social factors influencing economic decision-making, and to ascertain the general validity of the responses of the sample farmers.

This thesis employs a mixed-method approach in investigating the production and social behaviour of cocoa farmers. Arguments regarding the use of mixed methods generally relate to the relationships between theory, methods and data, such as whether data generated from the two approaches focus on different aspects of the research problem should be complementary or should be integrated if they are consistent with one another (for a discussion on these aspects see Brennan 1992: 69, 12-3). Further, Dunne *et al.* (2005: 162-74) provided an informative discussion on the methodological assumptions concerning the theoretical perspectives of the two broad approaches: the objectivist approach and its associated assumptions (realism, positivism, determinism and the nomothetic method), and the subjectivist approach (associated with nominalism, anti-positivism, voluntarism and the idiographic method) (see also O'Leary 2005a). On a philosophical level it is argued that

polarisation between 'object' and 'subject' in terms of maintaining objectivity in conducting research, whether in science or social science, can only go so far because, ultimately, the researcher/observer, in one way or another will always have some influence on the phenomenon investigated/observed (i.e., there is no absolutely detached observer in relation to the object being investigated/studied). This reinforces the argument that a sharp distinction between quantitative and qualitative paradigms is ultimately unnecessary because they will always overlap.

Nevertheless, irrespective of such broad theoretical perspectives, combined methods have been used by many researchers. For example, the contributors to the edited books by Eyles and Smith (1988) and Brennan (1992), have all used combined approaches in their particular studies. Some examples of smallholder case studies in PNG involving use of multi-method approaches, include: Koczberski *et al.* (2001), Koczberski and Curry (2003; 2004; 2005), and Curry, Koczberski, Omuru and Nailina (2007).

The advantages of using specific types of mixed method approaches discussed by Brannen (1999), Eyles and Smith (1988) and Fetterman (1998) include the following;

- *The combined approach* forces researchers to consider practical constraints on the research process;
- Using a *range of methods* appropriate to the research problem under investigation allows flexibility for researchers to canvass wider views;
- The use of *multiple methods* means that participant observation can be combined with questionnaire surveys in the field;
- *Mixed methods can generate multiple data sets* such as the head of household and spouse, reporting on the activities and actions of the households. Further,

some data may be collected using different methods at different times and in a variety of contexts, situations and settings; and

- *Multiple theories* can be used in the initial data analysis together with insights from the research process itself which can generate further possible theories and hypothesis about the research problem.

The choice of using mixed methods in research activities (see for example Brennan 1992: xii-iii, 1, 10-2; also Eyles 1988: 5-6), usually depends on the research problem in question and, related to this, are considerations of the research context of choice, such as the established preferences of policy makers, nature of the research team, and its social organisation. Such an approach was appropriate in my case in view of the objectives of my study and my involvement in socioeconomic research activities within the Economics and Planning Section of the CCI PNG.

First, the use of mixed methods was thought useful because, in past smallholder studies (e.g., Omuru, Fleming and Nailina 2001; Lummani and Nailina 2001; Lummani 2001) in which I was involved, the methods were based on standardised/rigid questionnaires which elicited mainly quantitative information from farmers for use in policy decision-making processes by the industry and its stakeholders. In this sense, the concern was less focussed on the perspectives of the village farmers. Therefore, it was thought that the mixed method approach would be appropriate in that it allows sensitivity and flexibility in taking into account the views and opinions of the farmers in their own terms.

Second, there was an expressed interest within the Economics and Planning Section of the CCI PNG (responsible for conducting cocoa and coconut smallholder socioeconomic research activities) for undertaking some research projects by involving researchers who are users of multi-method approaches. This interest was aroused in relation to the already noted studies (Koczberski *et al.* 2001; Koczberski and Curry 2004; Koczberski and Curry 2005) involving mixed method approaches for investigating productivity constraints in the smallholder oil palm sector in PNG.

These studies sought to provide a broader understanding of the economic as well as the social constraints on production by soliciting the views and opinions of smallholders through the use of mixed methods. It was realised that such an approach would be highly appropriate and suitable given the socio-cultural context of smallholder cocoa production in PNG and thus provide a useful complementary understanding.

I have used semi-structured interviews in my study comprising formal and informal interviews (see chapters in Eyles and Smith 1988; especially Porteous [75-93]; Donovan [180-96]; Cornwell [219-32] for examples regarding informal/depth interviewing). Formal interviews were used to obtain background information about households such as number of cocoa blocks and children, age of household head, wife and children, and level of education of household members, and whether they owned processing facilities and vehicles. The informal interview was mainly interspersed with my observations (see Fetterman 1998: 34-7, for discussion on participant observation in ethnographic research). It involved asking informal questions and recording the answers provided and/or engaging in informal and casual conversations in order to find important leads.

In line with the view presented by Brennan (1992, xiii), it was thought that the data sets thus generated would be used in a complementary manner to enhance the understanding of the constraints on cocoa smallholders' entrepreneurial decision-making and behaviour. As noted in Chapter 1 (pp.4-5), it was thought that this would be useful in terms of ultimately developing strategies for improving extension service delivery and cocoa smallholder productivity.

Selection Criteria

In view of the nature of the thesis research area, a combination of criteria has been used to collect data, especially random and non-random sampling (For fuller discussion on use of mixed criteria, see, for example, O'Leary 2005b: 79-97).

The rural cocoa farming household units identified were typical village farmers who live a village lifestyle. None of them was formally employed and the heads of farming households were all males. They are bound together by common social traditions and common patterns of beliefs and behaviours, social networks and shared hardships (Chapter 5, pp.85-9, 95-101).

The aim was to capture the reality of the rural cocoa farming households in order to enlighten policy making at the industry level. Thus, in selecting the farming households to be part of the sample, consideration was given to the fact that the sample should: i) allow for speaking about the parent population, ii) be large enough as to allow for conducting desired analysis, and iii) be small enough to be manageable. In fact, all the households have an equal chance of selection. The 36 households (about 72% of the total village households), were representative of the village farming households.

Four separate survey questionnaires incorporating semi-structured interviews, as summarised on Table 4.1, were designed (Appendices 2-a to 2-d):

Questionnaire	Type of Questionnaire	Content Summary
Questionnaire 1	Baseline Survey of Village Cocoa Farmers	Solicit general socio-economic baseline data from village cocoa farmers
Questionnaire 2	Survey of Cocoa Farmers Regarding Transport	Solicit social and economic information regarding transportation of cocoa and other cargo
Questionnaire 3	Survey of Marketing of Export Cash Crops	Solicit social and economic data on marketing of cocoa and other crops
Questionnaire 4	Weekly Monitoring Survey of Cocoa Farmers	Gather socio-economic data on transportation of cocoa and other activities via weekly monitoring
	Case Study Method	Solicit in-depth data on individuals concerning social and economic activities

Semi-structured Questionnaire Interviews

Semi-structured questionnaire interviews were considered appropriate in terms of gaining a broader perspective on the smallholders with regard to their economic decision-making. Thus, this approach was taken with an awareness of the tendency towards imposing theories onto the sample farmers in the survey. Accordingly, semi-structured interviews were considered preferable to fully structured interviews solely designed to derive certain information for statistical testing/for validating a theory. The approach used here involves deriving data from primary sources (i.e., the farmers). A substantial amount of information was collected over the three-month period of study, including characteristics of the study group.

Secondary Data

Secondary data including smallholder cocoa production for Bougainville for the period 1962-63 to 2004-05 and industry-based smallholder reports were examined in order to provide the historical context for cocoa production on Bougainville. The sources of secondary data provided in Chapter 5 are referenced in that Chapter.

A Review of the Relevant Literature

A brief review of the relevant literature was carried out to gain some synthesis of ideas from secondary sources and to gain familiarity with the appropriateness of the conceptual tool for understanding social phenomena. This was helpful for enabling me to gain some understanding about social influences on the economic behaviour of smallholders. It was also helpful in giving me a picture, although limited, of the frontiers of research in development studies and the major issues in that subject such as access to assets and power relations within small farming households, especially in the area of the case study. The review of previous

information was also helpful in terms of enhancing my capacity for critical thinking and for enabling me to see what kinds of additional data (beside those collected from past studies) were required for contributing to an improvement in the understanding of cocoa farmers in PNG's rural economy.

Baseline Survey of Village Cocoa Farmers

The aim of this questionnaire was to elicit general household information on: household cocoa holdings and production, sources of on-farm and off-farm income, processing facilities and costs of production, constraints on farming activities, household demographic details, adoption of children by farming households, membership in cooperative groups and associations, women's primary income sources, training and extension activities, and the farmers' perception of the efficacy of these training activities.

Survey of Cocoa Farmers Regarding Transport

This questionnaire consisted of five questions designed to elicit information from farmers about the transport of cocoa and copra and how kinship and social relations influenced transport costs. It also included questions about the use of farming tools and machinery.

Survey of Marketing of Export Cash Crops

This questionnaire was designed to elicit information from farming households regarding the marketing of cocoa, coconut and copra. The purpose of the survey was to collect information on the marketing of wet bean cocoa and copra, the marketing of dry bean cocoa and copra, the farmers' perceptions regarding crop marketing, and the potential for economies of scale.

Weekly Monitoring Survey of Cocoa Farmers

This questionnaire involved monitoring a selected number of farmers every week over a 12-week period. The focus was on six farming households. It involved monitoring how much cocoa was sold by the farmers, and observations of the influences of social and kinship factors such as family and friendship relations, regarding commodity production processes and the transportation and marketing of the crop. This information was recorded in a note book and on writing pads.

Secondly, it was also a way of checking the reliability of the baseline data. Thus, some information provided by farmers was validated through these observations. For example, the purchase of fuel for a vehicle owner by a farmer for transporting his processed beans rather than paying cash for transport, and the fact that no female sold processed beans.

The questions provided information from the farmers regarding the sale of wet and dried bean copra, incomes, weight, cocoa production activities, transport costs in relation to social factors, and how much time was spent on the cocoa blocks. Most of the answers in relation to this weekly survey were recorded separately in my notebook. After the fieldwork, I had time to reflect on the data in a more holistic way. This allowed me to develop the content of the data further, by drawing on remembered experiences that were deemed insignificant at the time, but which in hindsight proved important: first was an instance where a particular smallholder was assisted with supply of wet cocoa beans by his relatives for the purpose of meeting his deceased mother's ceremonial funeral expenses and the resulting question of whether he would reciprocate this gift in similar circumstances. The second instance involved a time-scale for a series of production activities (which had been taking place over time for meeting a brideprice payment for a younger farmer) and the portion of the relatives' harvest that was their contribution for this social purpose. During fieldwork, it was not taken into account properly whether contribution was made only during high production periods or also during low production periods.

The carrying out of the monitoring aspect of questionnaires 1-3 covered most of the fieldwork period, from the 1st of February to the 26th of March 2005. This

involved walking and re-visiting farmers at their homes and cocoa blocks and holding informal conversations with them, and note-taking, whenever there was a need to do so. A lot of discussions, conversations and observations as well as note-taking, involving transport and marketing, were conducted during travels with farmers who had dried cocoa beans to sell at Buin town. This included both farmers with and without vehicles. Some were made when traveling with farmers with vehicles transporting market goers, especially women, to the main market in Buin town, held every Tuesday and Thursday with the main one on Saturdays.

The monitoring survey of wet bean selling covered seven periods of wet bean sales over the fieldwork period from the 28th of December to the 26th of March 2005. This involved observing wet bean sales, and the dealer's wet bean prices. Activities in selling periods where the researcher was not able to attend were derived from the dealers' sales docketts.

Case Study Method

Case studies are often concerned with exploring the complexities of the phenomena being investigated. The focus is on an in-depth examination of one particular individual, instance, institution or occurrence, which can add much illumination to a body of knowledge (O'Leary 2005a: 115-131). As O'Leary (2005a: 116), pointed out, while an individual case study may not be generalisable, it can still offer much to the production of knowledge. The advantages of using case studies as listed by O'Leary (2005a: 116) are that, case studies can:

- have an intrinsic value – cases might be unique, interesting, or even misunderstood;
- be used to debunk a theory – one case can show that what is commonly accepted might, in fact, be wrong;
- bring new variables to light – exploratory case studies can often bring new understandings to the fore;

- provide supportive evidence for a theory – case studies can be used to provide anecdotal evidence for a theory or to triangulate other data collection methods; and
- be used collectively to form the basis of a theory – a number of cases may be used to inductively generate new theory.

In my study, I have used many case studies with regard to the individual sample units although not all the description and analysis of each of the 36 sample household units were included in the thesis. The idea was not only to understand but to ensure the integrity of the particular cases by ensuring their validity and reliability.

Remarks on Questionnaire and Interviewing

Overall, the four questionnaires were designed to elicit both quantitative and qualitative information from farmers. To ensure the reliability of questionnaires, many of them were pilot tested prior to fieldwork in several sites in the ENBP. Some were tested and adjusted in the early stages of the fieldwork during January and December 2004.

Data Analysis

Quantitative data were summarised using descriptive statistics. The quantitative data were entered on MS Excel and summarised using PivotTable and PivotChartReport programs in Excel.

Qualitative analysis was ongoing in the field and included content analysis of interview transcripts to identify important themes. Important themes emerging from the data were explored further in later interviews and monitoring surveys. This formed a significant component of the monitoring survey. Also it should be noted that, in canvassing the wider views of the villagers, almost 85% of the villagers were covered including those not directly involved in the study.

4.2 Some Advantages and Disadvantages of my Approach

There were both positives and constraints in conducting the interviews. Some of them are typical in fieldwork involving cocoa smallholder households in PNG as reported by Omuru (2001a: 15-18).

The positive factors included:

Familiarity with Socio-cultural Background of the Population

As an indigenous member of the community, I had an in-depth understanding of the socio-cultural background of the study group. But I also remained conscious of the fact that familiarity could also be a constraint regarding conduct of fieldwork in one's own culture in that one may not identify some things as being important because of one's familiarity with that culture. This was pointed out by my supervisor before fieldwork commenced and also discussed afterwards. Another RUSSIC (Research Unit for the Study of Societies in Change, Curtin University) researcher familiar with the area of study also discussed this issue with me and this helped me to re-think experiences in the field from a new perspective.

Respondents' Freedom of Expression

The respondents were able to express themselves and communicate with me freely in the local language, a shared medium of communication. Thus, conversations with respondents following interviews and through casual interactions were illuminating because they provided insightful information about their lives that would not have been easily discernible to non-indigenous researchers, such as the motivations underlying their commodity production actions, and their perspectives. It

can be very difficult for non-indigenous researchers to pick up on the nuances of motivational factors influencing economic and social behaviour.

Convenient Monitoring of Farmers

Twenty three farmers were within 0.5 to 1 kilometres from where I was residing, a relatively reasonable range of walking distance. Taking advantage of this, I was visiting and re-visiting them in their homes and farms from time to time. This also allowed me to see first hand how they were carrying out their farming activities, for example, who was assisting them in cocoa block slashing, and how assistants, if any, were paid. Sometimes I met farmers when they were working with relatives in their cocoa blocks for whom the relationships are known to me. At other times, I saw first hand how assistants in cocoa farming activities who were related to the farmer were paid for assistance provided.

Willingness to be visited by Interviewer

Many farmers were very willing to be visited because they saw me as being of a calm composure and open in terms of listening to whatever they have to say. Thus, whenever I visited them, farmers enjoyed the freedom of conversation and talked about their problems such as pests and diseases destroying their cocoa trees, and a host of other problems besetting them as farmers. They also talked about cultural values and traditions and how these were affected by changes in their communities and in the wider society, with some older folks expressing longings for a past social order. Because of our familiarity, they also felt free to converse with me, about pressing needs and obligations in their particular circumstances and situations, notably increased school fees, and about their hopes to build better houses, buy better vehicles, and meet the funeral and brideprice expenses of those who died and/or got married during the Civil War on Bougainville.

Trust between Interviewer and Farmers

Farmers trusted me and willingly conversed with me. There were many casual interactions and conversations from day to day which were revealing about them in relation to their perceptions about their farming activities and their priorities. For example, it was evident from conversations with them that one of their main reasons for producing cocoa was to meet increased school fees which they felt were very high. Thus, they felt they could trust me to present their concerns as part of my thesis research.

Home Residence

I lived in a family hamlet in a house specifically constructed for the fieldwork, and relatives sometimes attended to my needs. This also allowed me the opportunity to observe the influences of kinship relations in the context of the farmers' everyday lives and in terms of commodity production which took place at the time within immediate family circles such as between husband and wife, sons and daughters, brothers, uncles, cousins and friends.

Visit by Supervisor

My supervisor visited me at my fieldsite for about a week from the 8th to the 14th of January 2005, to monitor my progress. He accompanied me during fieldwork activities for four days to see if I was conducting interviews properly, and afterwards discussed relevant points accordingly: e.g., keeping focus in the process of data collection, ensuring sufficient examples, reminding me to map and photograph the village study site, and to map relationships of participant farmers (Chapter 5, p.95).

The constraints on fieldwork included:

Some Problems of Meeting Farmers

There were some untimely and delayed meetings with the farmers because they sometimes attended to their own priorities at pre-arranged times when I could not catch up with them on time because I was visiting them by travelling on foot.

Drunken Brawl

A drunken brawl among youths resulted in the burning down of the bush material toilet I was using. Fortunately, I was not using it at the time. This affected my temperament but I regained composure and continued the work. The toilet was rebuilt afterwards.

Query Regarding Monetary Rewards

A few farmers, who did not make it to the briefing at the beginning of the fieldwork, enquired about whether there were some monetary rewards for providing information but I explained further the purpose of my research and they understood and appreciated it.

Lack of Farmers with Vehicles in Selected Site

There was only one farmer in the selected village site with a vehicle. Therefore, some farmers with vehicles were recruited from bordering villages not selected for the study. Three farmers without vehicles were also picked from neighbouring villages because one farmer from Iamaru village selected for the study was caught up in personal problems. The other selected two live further away and were always spending time in the bush hunting and gardening in the hinterland.

4.3 Concluding Remarks

Overall, the mixed method approach relying on both quantitative and qualitative methods was appropriate for this research. The first component enabled me to get a handle on the quantitative aspects of cocoa production and the broader livelihood strategies of smallholders, while the qualitative methods provided insight into the social and cultural dimensions of livelihood strategies.

In the next chapter I turn to consider the historical and economic context of cocoa production by situating my study in a broader context of the farming environment of Bougainville smallholder cocoa households. This is followed by a discussion on Buin district and the village study site.

CHAPTER 5: THE HISTORICAL AND ECONOMIC CONTEXT OF THE STUDY SITE

5.0 Introduction

This chapter presents the physical, historical and economic context for the study. Cocoa output expansion, especially in the main producing countries seems to have been closely associated with deforestation rather than by population pressure and associated triggering of increases in productivity (Ruf and Siswoputranto 1995; also Chapter 3). Similarly, in Bougainville and in PNG generally, land is plentiful so that cocoa productivity/ha remains low, consistent with an extensive system of cocoa cultivation (Chapter 3). The purpose of this brief overview of the historical evolution of Bougainville's cocoa economy is to contextualise cocoa cropping and cocoa technologies in relation to a changing rural society increasingly characterised by population growth and cash needs (Chapter 2). Bougainville, for instance, remained a relatively egalitarian society until the 1950s, with limited material wealth to accumulate and with social mechanisms in place to limit individual accumulation (Regan 1995, 2005). Interestingly, however, there has been a rise in individualism since then, but this is still tempered by indigenous and introduced socio-economic and religious obligations. The chapter begins with a brief overview of the general physical, cultural and agro-climatic features of Bougainville and, the current situation after the Civil War. Then it discusses general agriculture and cocoa production in Buin district and Iamaru village.

5.1 Geography of Bougainville

Bougainville Island is about 200 km long by 60 km in width at its widest part, with an area of 9,429 km² (Thompson 1991: 72). The chain of mountains which form its backbone rise to 2,715 metres at Mount Balbi, an active volcano. The large island of Bougainville and the adjacent Buka island, together with a number of smaller islands and outlying atolls, form Bougainville Province, the most easterly province of PNG (Figure 5.1). It consists of three main regions (north, central and southern) containing 13 districts. Not all of the smaller islands around the main island of Bougainville are inhabited by people.

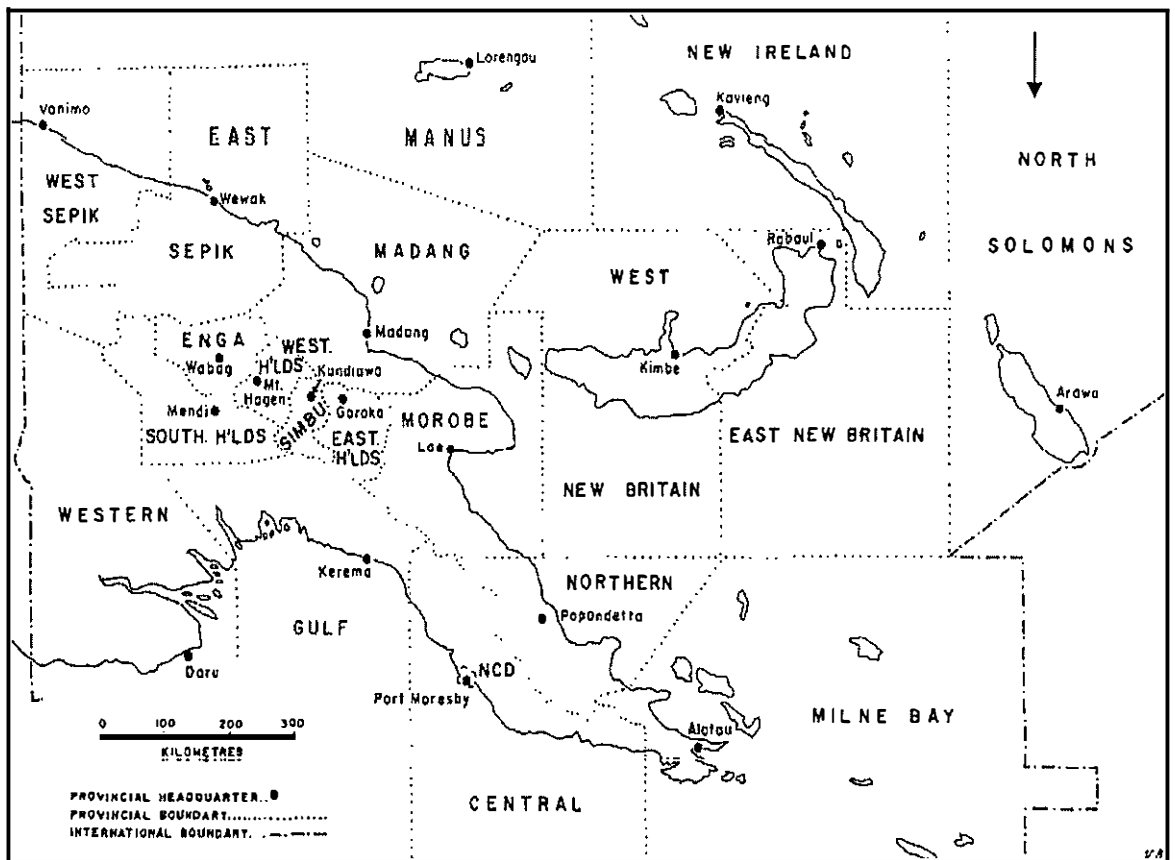


Figure 5.1: Map of Papua New Guinea showing the Study Region: Bougainville (North Solomons) (Source: Uitto, J.I & Ono, A (eds.) 1996, Chapter 4: *Land-use Change and Population in Papua New Guinea*, United Nations University, Tokyo, Japan)

The larger island has relatively little flat land except in the northern and coastal areas. Its fertile soils coupled with rainfall which rises to 5,000 mm a year in the mountain areas, allows cocoa and copra to be grown successfully as commercial

crops. The area classified as having very high potential for cocoa growing and other smallholder cash and staple crops is 1,100 km², is largely confined to the north-eastern coast of the island (Hanson *et al.* 2001b: 34). There are large variations in population density, with areas like Carteret Island in the atolls with 1,224 persons per km², being the highest in PNG (Bourke and Betitis 2003: 4-6).

Climate

The climate is typical of the humid tropics with distinct wet and dry seasons. Temperature, humidity and rainfall are all high and comparatively uniform. Rivers on Bougainville are generally short with steep upper catchments and very flat coastal stretches (Thompson 1991: 72).

Rainfall increases from north to south. Mean annual rainfall for Buka is about 2,400 mm, with June to October being the driest period, but with mean rainfall in all months exceeding 100 mm. Rainfall at Kieta is 3,000 mm/year, with all months receiving about 200-300 mm on average. Rainfall in south and south-west Bougainville is higher, with Buin receiving about 4,100 mm/year, with all months receiving over 200 mm/month. July-August is the wettest period of the year with 450-600 mm/month (McAlpine 1967; Scott *et al.* 1967).

5.2 Agriculture

As with other societies in Melanesia, Bougainvilleans are typically swidden horticulturalists raising root crops and pigs, supplemented by fishing, hunting and foraging, depending on the nature of the local environment (Ogan 2005). Staple crops originally included taro (and, from the 1940s onwards, sweet potato) and to a lesser extent yam, with additional sugarcane, bananas and breadfruit (*Altocharpus atilis*). A detailed national study conducted by the Commonwealth Scientific and Research Organisation (CSIRO) in the 1980s found that 55 per cent of the provincial landmass was devoted to agricultural land use, where that was defined by the presence of anthropogenic vegetation (altered by humans), current food gardens and cash crops (McAlpine and Quigley, n.d, Table 1, cited in Lummani 2005: 241).

The majority of the people live and practice agriculture along the coast of the two main islands but populations in the mountains inland of Tinputz and Wakunai in north-east Bougainville and in the southern part of Bougainville island live at up to 1,100 m above sea level (Bourke and Betitis 2003: 4). The traditional agriculture of Bougainville consists of shifting cultivation in which bush and secondary forest is cleared, organic matter heaped or laid along the edges of the garden with the garden then planted to a mixture of crops. Typically, garden sites are cropped for over three years and then left to fallow, traditionally for about 12 years (Oliver 1955), when population pressure was low. As population has grown, fallow periods have shortened to a bush fallow system with fallows from two to five years in some places (Bourke *et al.* 1998). The length of the garden cycle has also increased.

The agricultural system is generally based on fallowing land, with some exceptions, especially in the atolls such as the Mortlock islands where there is a permanent pattern of cropping due to land shortages there (Table 5.2, p.77). Land use is generally moderately intensive on Bougainville and Buka and very intensive on the smaller islands (Bourke and Betitis 2003). While shifting cultivation is capable of supporting populations that were more or less stable in numbers, its capacity to provide for a growing population, over time, will depend on the amount of uncultivated land available, the ability to access that land through customary land ownership arrangements and the fallow period needed to return farmland to fertility. Other factors include the availability of and affordability of artificial fertiliser or access to soil management techniques such as those familiar to farmers using organic methods that do not rely on artificial fertilisers.

Food Sources

Sweet potato (*Ipomoea batata*) is the most important food crop, accounting for 65% of production of energy foods by weight (Table 5.1). Other garden foods include taro (*Colocasia esculenta*) (especially in mountainous locations), green vegetables including aibika (*Abelmoschus manihot*), pumpkin tips (*Cucurbita moschata*), ferns (*Diplazium esculenta*) and choko tips (*Sechium edule*). Numerous other food crops are grown including swamp taro (*Cyrtosperma*) and Polynesian chestnut (*Inocarpus fagifer*) on the Polynesian atolls. The main fruits planted and

cultivated by farmers include wild mango (*Mangifera sp.*), Malay apple (*Syzygium malum*), pawpaw (*Carica papaya*), pineapple (*Ananas comosus*) and rambutan (*Nephelium lappaceum*) (Bourke and Betitis 2003: 6-7).

The main food crops cultivated by farmers are listed in Table 5.1.

TABLE 5.1: BOUGAINVILLE'S ESTIMATED ENERGY (STAPLES) FOOD PRODUCTION IN 2000

Food Crop	Estimated Production (Tonnes/Year)	Proportion of Total (%)
Sweet potato (<i>Ipomoea batata</i>)	103,600	64.8
Cassava (<i>Manihot esculenta</i>)	18,900	11.8
Banana (<i>Musa</i>)	12,600	7.9
Coconut (<i>Cocos nucifera</i>)	9,500	5.9
Chinese taro (<i>Xanthosoma</i>)	7,800	4.9
Taro (<i>Colocasia</i>)	3,900	2.4
Yam, lesser (<i>Dioscorea esculenta</i>)	1,400	0.9
Yam, greater (<i>Dioscorea alata</i>)	1,300	0.8
Swamp taro (<i>Cyrtosperma</i>)	560	0.4
Sago (<i>Metroxylon sagu</i>)	300	0.2
Rice (<i>Oryza sativa</i>)	40	0.02
Total	159,900	100.0

{Source: Bourke and Vlassak 2004. *Estimate of food crop production in Papua New Guinea*, ANU}

Marine foods are commonly consumed along the coast and include fish, shellfish and octopus. In inland locations on Bougainville, people eat more pig meat (*Sus domesticus*) and game meat including possum (*Petauridae*) and flying fox (*Pteropus*). Some pigs and chickens are maintained but contribute little to overall daily food intakes. People gain very little food from hunting and this is not a source of food for people where population density is high, such as the small islands (Bourke and Betitis 2003). Coconut is commonly used as an ingredient in cooking in most locations on or near the coast. According to Bourke and Betitis (2003: 6), an estimated 9,500 tonnes of coconut are consumed as food within Bougainville and Buka islands, and coconuts are an important food source on the small islands.

Population Densities

The Province has a total population of about 175,000 (*PNG 2000 National Census*), but population density varies immensely between Bougainville Island and outlying islands and atolls (Table 5.2). The overall population density is not high on

Bougainville Island with a range of four to forty one persons/km² at the LLG level, with a mean figure of 15 persons/km² for the entire island (*PNG 2000 National Census*). Prior to the Civil War, the rate of population growth at about 3% was one of the highest in PNG (North Solomons Provincial Government Study 1982). This high rate of population growth was partly attributable to improved medical services on the island and a high rate of in-migration from other provinces.

Table 5.2: Crude Population Densities by Local Level Government (LLG) in Bougainville Province for 2000

LLG Area	Population	Area (km ²)	Population Density (persons/km ²)
Tinputz	9,767	641	15
Kunua	9,089	1,029	9
Selau-Suir	9,446	443	21
Buka	36,676	616	60
Nissan	5,725	39	147
Atolls	2,388	11	217
Wakunai	10,023	1,147	9
Arawa	31,462	1,610	20
Buin	26,469	1,471	18
Siwai	13,724	743	18
Bana	14,882	367	41
Torokina	5,509	1,312	4
Total	175,160	9,429	19

{Source: National Statistical Office 2002. *2000 National Census Unit Register, North Solomons Province*}

Relatively low population densities and high land accessibility means that most cocoa farmers rely on family labour (no landless labour). This also means that almost everyone has had the opportunity to become a cocoa grower and this situation still appears to be true in many areas of Bougainville. Thus nearly everyone is a potential cocoa grower.

As indicated above, there are few landless rural people who could be employed by other cocoa farmers. This is a key issue affecting the supply of hired labour (Chapter 9, p.160). However, as I argue later in the thesis, factors causing low productivity in cocoa production within producing regions are probably also to be found in the farming households' social institutions.

5.3 Cultural System of Land Ownership

In terms of social organisation, the Bougainville populace is generally divided into dispersed matrilineal clans which provide a fixed reference point for individuals (Ogan 2005: 49-51). Clan residents share rights to exploit particular tracts of land. The tracts of land are strongly identified with particular clan or subclan groups (Thompson 1991: 72). Although matrilineal kinship is important for the transmission of land rights, such rights are normally exercised by men. Further, as Thompson (1991) pointed out, it would be difficult for any clan that lost its land such as through leasing, selling or alienation by government, to obtain access to other tracts of productive land in the same area, much less to land in different areas of the island.

The planting of cash crops converted many tracts of land traditionally used for gardening into areas now regarded as being owned by particular individuals or small groups (Thompson 1991; Lummani 2005). Up to the outbreak of the Civil War, land was increasingly being purchased with cash, thus individualising ownership patterns in various areas.

Dynamics of Traditional and Modern Economic Principles

As in some Melanesian societies, Bougainville has a chiefly (command) system, with no organised marketplace dictating use of resources. A basic motivating factor behind accumulating wealth¹ and power in Bougainville (common in Melanesian societies), was increasing one's 'ability to share or give away one's possessions', a debt usually repaid with an even larger gift, resulting in an increase in wealth and power of the giver and a decrease for the receiver.² What is perhaps worth noting in relation to smallholder households is that the problem of utility maximisation is culturally embedded. In the past it was usually the chief who was faced with the utility maximisation problem of trying to increase his utility (satisfaction), while at the same time facing constraints imposed by nature and society. In an attempt to maintain respect, favours and wealth under the modified circumstances of today, rural cocoa households use resources to satisfy their own needs, and to carry out their social obligations/responsibilities, and to provide for

others in this regard. This accords with current literature (e.g., Guiso *et al.* 2005a, 2005b, 2006; also Vanclay 2004), which is now increasingly noting the fact that tradition-shaped attitudes and lifestyles are dynamically persistent and can significantly influence human behaviour and economic outcomes. In the case of cocoa households in Bougainville and PNG more generally, policy actions influenced by an emphasis on the instrumental rationality of human behaviour over their socio-cultural reality could result in poor socio-economic outcomes in terms of household entrepreneurial management-related productivity outcomes. This point is taken up in Chapters 7-8.

5.4 The Evolution of Bougainville's Cash Economy

Cash economies had operated on Bougainville to varying degrees between 1914 (possibly earlier) and 1942, stimulated by the introduction of a head tax by the Australian administration designed to bring locals into the cash economy (Sack 2005: 77-107).

From prior to WWI until late 1950s, the cash economy of Bougainville was centred on European-owned plantation copra inter-cropped with only a few cocoa groves owned by church missions (relating to this, see for example, Regan and Griffin [eds.] 2005 *Bougainville Before the Conflict*; Connell 1978: 131-79; Treadgold 1978: 1-30). During this period, the main source of cash income was wage labour, largely in copra plantation work.

The pre-war cash economy was destroyed during WWII but reconstruction and recovery were relatively quick and completed by 1950 (Treadgold 1978). Three factors contributed to the rapid re-building of the economy: the favourable postwar prices for copra (especially early 1950s) following the depressed period of the 1930s-40s, the commitment of Australian resources to the region, and war damage compensation made to indigenous Bougainvilleans (Treadgold 1978; Connell 1978).

The expansion of the cash economy after 1950s is especially associated with plantation agriculture, indigenous smallholder cash cropping, and copper mining. The plantation sector, the largest monetised sector, was the principal force behind

economic growth throughout the 1950s and much of the 1960s (Treadgold 1978). Initially, production was centred on the traditional crop of coconuts (copra), but under the stimulus of high prices in the early 1950s, cocoa planting (inter-planted with coconuts) increased rapidly.

Cocoa Based Economic Prosperity and Smallholder Cash Needs

Since the early 1960s, spurred by better crop prices and increasing social, population and economic pressures, cocoa farms on Bougainville have been in a state of active development, and it remained a predominantly smallholder crop until the Civil War in 1988-89 (Lummani 2003).

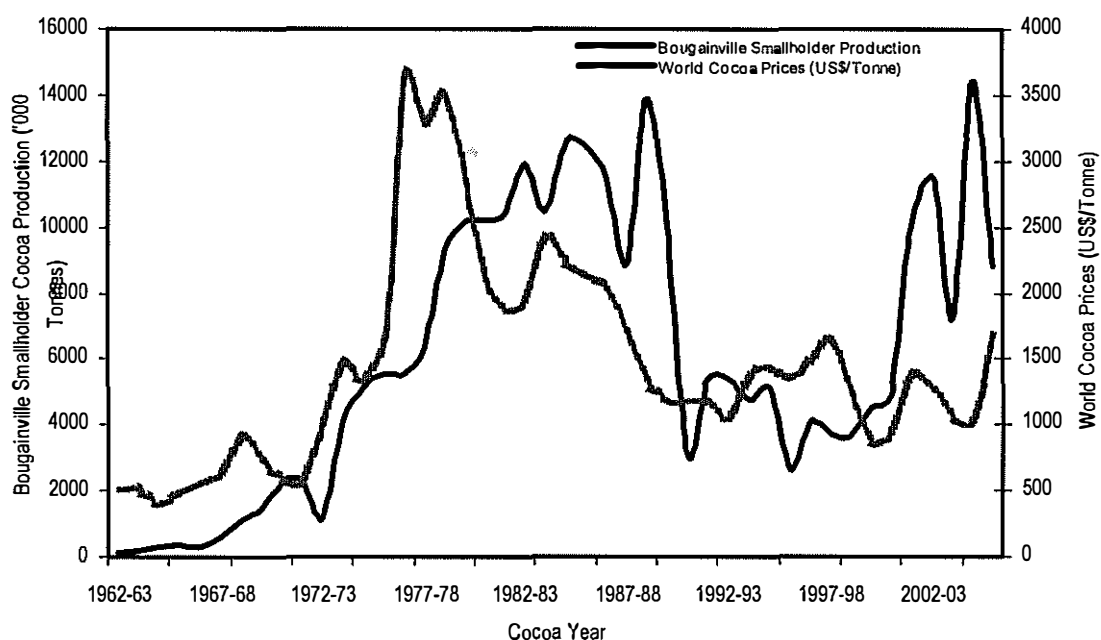


Figure 5.2: Smallholder Cocoa Production on Bougainville: 1962-63 to 2005-06 {Source (s): 1. 1962-63 to 1965-66 from North Solomons Provincial Government Study 1982, Vol. 2, Part 2, chapter 23: 11; 2. 1966-67 to 1977-78, North Solomons Provincial Government Study 1982, Vol. 2, Part 1, Chapter 1: 1; 3. 1978-79 to 2004-05 from the Cocoa Board of Papua New Guinea. Sources for cocoa prices: 1960-61 to 1995-96 from ICCO; 1996-97 to 2001-02 from LMC; 2002-03 to 2005-06 from ICCO. Note; Figure 5.2 shows continued production during the Civil War. This is because stocks left over before the Civil War were already in Exporter Cocoa Sheds in Rabaul, East New Britain Province (awaiting shipment overseas), when the Civil War started (*PNG Cocoa Board's Economics Section*, pers. communication, April, 2007). These were already recorded in invoices as produce from Bougainville, hence treated accordingly, by the Cocoa Board's Economics Section when compiling cocoa statistics by cocoa year (01 October – 30 September). Prior to the Civil War, many exporters on Bougainville had permanent Exporter Sheds in Rabaul, where export quality cocoa beans brought in from Bougainville were stored for shipment overseas}

Figure 5.2 shows the world market prices and smallholder production trend, indicating the general level of economic prosperity enjoyed by Bougainvillean smallholder cocoa households until the Civil War. Before the Civil War in 1980, for example, average cash income for rural households was K702/household, equivalent to K154/capita, of which cocoa contributed K131 and copra K23, while the provincial average income from cocoa growing households was K807/household (Lummani 2005: 245), a relatively high income by PNG standards at the time.³

Apart from the lower cocoa prices experienced in 1965 and during 1970-72, production increased steadily until the early 1970s, rising by about three fold in 1973-74, and by about 16% per year until 1989-90. According to Connell (1978: 161), the increase in prices, especially from the mid-1960s, enticed many households to adopt cocoa in preference to other crops such as rubber and rice, introduced by the Australian administration in the 1960s to encourage diversification.

Bougainville was also one of PNG's main cocoa producing provinces from the 1960s to the 1980s. Before the Civil War total production from Bougainville reached its highest level in the country in 1988-89 with 18,441 tonnes (Lummani 2005). Of this, 75% (13,841 tonnes) was produced by smallholders. Subsequently, output declined as fighting intensified. The Bougainville Civil War resulted in a collapse in cocoa plantation production in the province with almost all plantations ceasing production by 1991 (Bourke and Betitis 2003: 10-11). The plantations remain but have not been rehabilitated since the Civil War.

Most of the period until the Civil War was marked by a generally consistent upward trend in smallholder cocoa production until 1984-85 and, subsequently, was on a steady decline until 1988-89, when it rose sharply by 56% to 13,841 tonnes at a time when cocoa prices were sharply falling (Figure 5.2), mostly due to increased plantings that continued until then. When fighting ceased in 1996, farmers began resettling in villages and rehabilitating old blocks and planting new ones. Hence, production has increased since then (Figure 5.2). Production increased significantly towards the end of 2002, although it was still less than smallholder levels prior to the Civil War. This was mainly due to high prices in 2002 and improved road infrastructure on Bougainville and Buka. The downturn in 2003-04, was mainly

attributed to unfavourable weather in the main producing regions of Bougainville (PNG Cocoa Board Market Reports 2003), but production is expected to increase rapidly as people expand plantings in order to meet their dire cash needs and compensate for lost opportunities during the Civil War.

Smallholder Cocoa Holdings Per Hectare Per Grower

Most cocoa smallholdings before 1970 were very small, with ownership of more than 1,000 trees (some 1.5 ha) exceptional at the time. However, individual plantings in Buin started to increase around mid-1965 to about 1,000 trees or more (Connell 1978: 153). Village cocoa holdings/ha were estimated at 1.14 ha/grower in 1980 and 1.45 ha/growing household in 1982 (Lummani 2005: 246-7). Typically, the cocoa farming system in Bougainville involves small plots of not more than 2 ha, with leucaena shade in association with a variety of annual crops, providing food and incomes for the households.⁴

Smallholder Productivity Per Hectare

As shown in Table 5.3, yields/ha in the 1980s were more variable than in the 1960s and 1970s, the main reason being the genetic yield variability of the planting material distributed in the early 1980s (Lummani 2003).

Table 5.3: Mean Smallholder Cocoa Productivity Per Hectare (Dried Bean Equivalent) on Bougainville

	Overall: 1962-63 to 1980s	1960s	1970s	1980s
Mean	0.32	0.14	0.42	0.35
(S.d)	(0.17)	(0.07)	(0.11)	(0.18)

Note; Production figures are from Lummani (2005) while smallholder hectareage figures from 1962-63 to 1971-72 are from Treadgold (1978). Productivity figures from 1971-72 to 1989-90 are extrapolated using hectareage, growers and production figures from Treadgold (1978) and Lummani (2005).

Overall, in the period from 1962-63 to 1972-73, the smallholder area (ha) of cocoa on Bougainville increased six fold and production 25 fold. Alongside the large expansion of cocoa plantings from 1960s to the 1980s in most parts of

Bougainville (Lummani 2005: 246), productivity/ha gradually increased to around 0.42 tonnes/ha in the 1970s.

Early Participation in the Cocoa Economy

In Bougainville, as elsewhere in PNG, the decade prior to the mid-1970s was a time of cocoa ventures in the form of cooperatives and cocoa companies, involving men from different lineages within a village. But as Connell (1978: 156) pointed out, few of these cooperatives were operating successfully by the mid-1970s, while most were carried away by the tide of individualism. It was reported that, despite the successes of many of them for over a decade, problems such as continual disputes over the organisation of work and the use of income from crop sales led to the eventual decline of the cooperatives, at least within south Bougainville where such arrangements proliferated throughout the 1960s until the mid-1970s (Connell 1978: 156-9).

In a discussion with the former chairman of the PNG Cocoa Board (Lomotaku, pers. comm., June 2002), he argued that cocoa cooperatives similar to those of the 1960s would be unworkable today because people are now more individualistic. However, many cocoa households continue informal communal activities along family lines and through friendship ties. In fact, cocoa farmers engage in many informal cooperative activities to ensure economic and social security and to generate household incomes, especially in difficult circumstances, or in prolonged low production periods, but these tend to be along family lines.

The Current Situation

The present condition of households on Bougainville in terms of wealth, although gradually improving, is much lower than before the war. Following the Civil War, levels of cash income for rural villages in Bougainville province were moderate by PNG standards. According to Bourke and Betitis (2003), incomes range from very low in the interior of the island and remote islands to moderately high in Buka island, Selau/Suir LLG and coastal locations in Tinputz and Wakunai (see Bourke and Betitis 2003, pp.10-13, 50, 60, 64, 77). These range from

K9.96/person/year in Nuguria to K86/person/year in the Mortlock islands and K99/person/year in Carteret island during 2001-2002.

Table 5.4 shows the main income sources in Bougainville province for rural households in 2003. These include sales from agricultural and marine produce, including cocoa, copra, fresh food, betel nut, fish, beche-de-mer, trochus, and shark fin (Bourke and Betitis 2003). Remittances of cash from relatives working in urban centres are a relatively minor source of income. Occasionally, income is earned from the sale of handicrafts to tourists or other locals. The majority of coconuts are sold on Buka Island because coconut palms are a predominant source of income there.

Table 5.4: Income Sources in Rural Villages

LLG Area	Main Income Source	Other Sources
Carteret islands	Beche-de-mer,	Trochus shell, fresh fish
Mortlock islands	Trochus shell, beche-de-mer, remittances, handicraft	Coconut fibre cord, pandanus mat, traditional chairs
Nuguria islands	Beche-de-mer	-
Tasman islands	Beche-de-mer	-
Nissan islands	Copra	Some cocoa, fresh food, fish, trochus shell, shark fin
Pinipel islands	Beche-de-mer	Barter fruit for banana, sweet potato, and breadfruit from Nissan islanders
Hetau and Pororan islands *	Fish, little copra	Trochus
Matsungan island *	Fish, trochus, little copra *	Shell fish, cooked cassava dish, fruits, beche-de-mer
Petats island *	Fish, trochus	Some cocoa
Buka island	Copra, cocoa	Fresh food, betelnut, sweet potato, taro, mango, tulip, galip nut, sago grabs, vegetables, fruits and nuts, mud crabs, prawns, fish, shellfish, cooked dishes including cassava
Selau-Suir	Copra, cocoa	Fresh food, fish, betelnut
Tinputz	Cocoa	Fresh food, fish, pigs, chicken and betelnut
Wakunai	Cocoa	Fresh food, pigs, chicken, fish, betelnut, sweet potato, cabbage, peanuts
Arawa	Cocoa, fresh food	Fish, pigs, chicken
Buin	Cocoa	Pigs, chicken, fresh food
Siwai	Cocoa	Pigs, chickens, fresh food, fish
Bana	Cocoa	Fresh food
West Coast	Cocoa, copra	Fresh food

(Source: Bourke and Betitis (2003), see pp. 17-8, 47-95; * grouped as Western islands by Bourke and Betitis (2003))

5.5 Buin District

Buin district lies between the Luluai and Mivo rivers and is centred on Buin station (Figure 4.1, Chapter 4, p.55). Most parts of the district have volcanic soil, rich in organic matter. Most people live inland, with only a few coastal villages. There are two main landforms used by the people: the outwash plain and the foothills of Mt Taraka (Bourke and Betitis 2003: 86). The altitudinal range of land used for agriculture is from sea level to about 800 m (Bourke *et al.* 1998: 49).

The commercial crops of cocoa and copra and garden crops - cane, banana, sweet potato and a variety of other food crops are grown at lower altitude areas, while taro and yam are common in high altitude areas. Some upland areas, along the foothills of Mt. Taraka, are classified as relatively high population density areas (see Hanson *et al.* 2001a: 283, 286-88).

There is a very high level of cloud cover associated with the high rainfall. Both factors reduce the potential for both food and cash crops, despite the generally fertile soils from volcanic ash.

The district has the second largest land area in the province, with the third largest population with a current resident population of 26,469 people, giving a relatively higher population density of 18 persons/km² (Table 5.2, p.77), compared with the Province's average of 15 persons/km².

Pre-Mission Buin Life

Traditional Buin society was a stratified hereditary three-class system: *mumira* (chieftain), *minei* (wealthy half-breed and kinsmen of the *mumira* aristocracy), *burepi* (man of means) and *kitere* (bondsmen), while its earlier matrilineal system was displaced by a latter emphasis on paternal descent.⁵ The chiefs did not form a single entity. There was a paramount chief (*mumira tutoberu*) for all of Buin appointed by smaller chiefs (*mumira*) in the district, whose families made up an aristocracy, with *minei* and *burepi* being the intermediate classes, the main supporters of the chief.

Like other Melanesian societies, the social order and economy were based on a holistic view of life where religious conceptions, social and political agencies and the economy were all inter-related (for detailed discussion pertaining to this, see Thurnwald 1936: 125-38). Based on Thurnwald (1936), the following features characterised the social order of the time:

i) Wealth was bound up with prestige

Economics was intimately bound up with social standing and prestige. A man's status depended on his wife's competence in raising pigs and on his ability to dispose of pigs in ways that fulfilled all kinds of social obligations. So the influence of social institutions on the disposal of material resources was significant. The chief was only a nominal owner of resources.

ii) To be enjoyed, wealth required the participation of kinsmen and the community

The sharing of wealth was important. The chief was bound up with the people, for he was their leader, socially, politically and economically. He depended on them for their respect and support and he provided leadership, protection and care. Thus, occasionally he would make the network of social relationships felt by holding feasts for events such as marking the stages of a child's growth, marriage and ritual ceremonies.

iii) The display of wealth and not its possession was the source of prestige

Throughout Melanesia the pig greatly affects social prestige without noticeably adding to mass subsistence. So, as in all societies and in all times, status was an element of past Buin life. The chief would often make lavish feasts in order to display his wealth which, in fact, belonged to the people under his care. Although it may seem elitist, this was a way of continually asserting his status as a chief.⁶

- iv) Wealth was also a socialising force through its constant exchange thus spreading goodwill among the persons involved in the exchanges and supporting social solidarity

Commerce was a symbol of friendship. For instance, wealth was used in terms of restoring ruptured relationships between chiefs and clans caused by fighting or sorcery. For example, using modern wealth (money), this principle was used in acts of reconciliation in order to restore strained relationships, both within and outside of family circles, following the Civil War.

Today, men's interests no longer centre around women, pigs and shell valuables (cf. Thurnwald 1934: 124). Cash has largely replaced shell valuables, traditionally used to recompense various objects and services, pigs and wives, while feasts held for many occasions have generally become negligible, especially since the 1980s. Traditions, however, remain alive in peoples' lives, and the Civil War has led many households to seriously reconsider their past and to build upon elements compatible to a modern environment. Buin as it responds to these changes has been described as a living culture (e.g., Keil 2005: 342).

Family and Economic Activities

Table 5.5 shows the division of labour between the sexes. Garden labour is gender specific with men responsible for activities such as land clearing, but most garden activities are shared by both sexes. Women mainly plant, harvest and transport garden harvests home. The types of crop grown are also traditionally gender specific. Men had greater responsibility for the tree crops, which were grown around the house or the household farm. With the arrival of cash crops, men have tended to take control of them while women have tended to dominate in the production and marketing of garden crops (Chapter 6). No detailed smallholder study had been carried out in Buin for many years, but, based on observations during my fieldwork, the introduction of cash cropping in Buin appears not to have substantially altered the gender division of labour in agriculture, but it has led rather to an intensification of women's work. Women are working harder by taking on additional tasks such as harvesting cocoa (cf. Mitchell 1976). Labour has not yet become more

gender neutral and flexible in response to cash cropping as one might suppose. Men have access to the unremunerated labour of their wives and their labour was and still is important in maintaining the daily needs of the household (e.g., Nash 1981; 1984).

Table 5.5: Traditional Division of Farm Labour

Farm Type	Crops Grown	Exclusively Female Tasks	Exclusively Male Tasks
Household farm	Taro, yams, banana, sugarcane, tobacco	Burning of timber and small branches in the garden, planting, daily cooking, carrying loads of firewood, and water, feeding of pigs.	Cutting and washing of sago, making puddings of sago and coconut, sago and galip nut, taro and coconut, taro and galip, cooking of pigs

{Source: Richard Thurnwald (1934, 1936; see also Hilde Thurnwald 1936)}

Thus, villagers have retained some aspects of their traditional pattern of daily life, such as the women's activities carried out at the hamlet and in the garden: minor weeding and planting and harvesting of taro, sweet potato and yam, tending pigs, caring for children and the husband, fetching water and firewood, cooking and weeding around the house. Also, occasionally women can still be seen doing female activities that women in the past used to do, as reported by Thurnwald (1934; 1936), such as the collection of herbs, roots and berries, catching crabs and shrimps. He also reported some male activities in the past like plaiting of baskets, weaving nets or bags, carving bamboo cases or gourds for lime, dressing and ornamenting coconut shells as water bottles, cutting spears, bows and arrows. Many such activities have been displaced by new male tasks suited to the context of changed circumstances. Today, activities for men mainly include: planting and maintenance of cocoa and other cash crops like vanilla, preparing and transporting wood and other bush materials for housing (residential and separate kitchen construction), clearing of primary forest/heavy secondary growth for gardening, transporting heavy loads of wet cocoa/copra beans, killing and transporting pigs on feasting occasions. The following male activities occasionally generate incomes (sometimes for the man's own use): cutting and sawing timber with chainsaws, sea and fresh water fishing, hunting possums and pigs, and digging of wild fowl eggs.

The staple food crops now are: sweet potato, yam, taro and banana. Both traditional varieties of banana and those from other parts of PNG are grown. Traditional food crops like pawpaw and sugarcane are also grown alongside introduced crops such as cucumber, water melon, spring onions and a limited range of vegetables. Traditional greens eaten by villagers included a variety of bush ferns. Today, a mix of vegetables and greens are raised for sale at local markets and for household consumption.

Overall, reciprocity was important in terms of regulating trade around an egalitarian ideal of 'equivalence', while liberality in terms of borrowing items from kinsmen was, and still is, very much part of the people's lives. So, Buins are a people evolving from a stratified, hierarchical and aristocratic society, whose chief, (Thurnwald 1912, 3: 48, cited in Griffin 2005: 211) is described as *primus inter pares* (the first among the equals), for he was housed, fed and slept just like everybody else. This transition has been accentuated by the socio-political and economic context of modern society with its upholding and promotion of equal human dignity, individual freedom and initiative, and equal rights of access to opportunities that society offers including individual wealth accumulation. As elsewhere in Melanesia, such elements which constitutes today's lifestyle were not part of the former society of Buins.

5.6 Outside Contact through Trade, Missionary Activity and War

Early contacts of Buins across the Bougainville Strait and within the Buin district, were marked by barter of objects like pigs, sago, taro, and nuts. Buins used different types of shell money (e.g., red shells or *onu* and white *onu*), traded into Buin at an early time from Alu and Roviana in the Western Solomons (Thurnwald 1934: 136). The Buins, therefore, have had extensive and varied contact with the Western Solomons across the Bougainville Strait, but the earliest contact with the non-Melanesian world is said to be with European traders between the 1800s and 1900s (see Bennett 2002: 68). Although Buins showed little interest for working on plantations at the time, from the mid-19th century, European traders and local chiefs in the nearby Western Solomons had collaborated to exploit the connections that had

existed between the Buins and, especially the Alu and Mono Islanders, for German plantation developments (Bennett 2000).

The European pioneers in Buin and also in Bougainville were Germans and French Marists (Elder 2005: 159). The Marist Fathers established a station in Buin in 1905 after settling in Kieta in 1901 from the Shortlands (Elder 2005: 140-41, 152). Thereafter, stations were established at Turiboiru in 1912, Muguai in 1914 and Morou in 1916 (Laracy 2005: 109-10). The increased demand for labour for newly established plantations saw the Germans open a station in Buin in 1913, just before WWI in 1914 (Bennett 2000: 72; Sack 2005: 101). Under the German administration, especially before 1914, the Franco-German Marists had been encouraged to establish and expand their mission in Bougainville (Elder 2005: 152, 156). The Marists operated plantations on a commercial scale to defray their costs and to introduce converts to industrial labour (Elder 2005: 152). The Germans saw that Buin had a large reserve of labour but recruitment was difficult due to constant feuds and fighting. This problem was finally settled by a costly punitive expedition, paving the way for considerable pacification of the area by 1920-21 (Elder 2005: 150-51).

The achievement of a stable peace paved the way for the spreading of mission stations and labour recruitment in the Buin area (Laracy 2005: 119). The first plantation on Bougainville was established in 1908 on the east coast of the island, and by 1918, many Bougainville villagers, including Buins, were employed on the new plantations (Elder 2005: 155). Many Buins were also catechised and attended mission schools (Elder 2005: 150).

The Australian military administration took over Bougainville in 1914 (Rowley 1958: 119 cited in Elder 2005: 155), and, Buins, together with other Bougainvilleans were introduced to the cash economy under the Australian administration (Elder 2005: 156). By 1933, much had changed following the Australian control of Bougainville but according to Thurnwald (1936: 351-53), the core of the Buin culture had also been weakened by appointing *kukurais* (government appointed chiefs) who were not from chiefly families and by the destruction of the ceremonial hall of a paramount chief of Buin. The exercise of

power helped the administration to eliminate head hunting and expedite the mustering of workers for the plantations through the safe entry of labour recruiters into an area previously closed to them (Thurnwald 1936).

The Emergence of Buin Cash Economy

The pace of change of the economy of Buin was quickened by the emergence of the plantation economy beginning in the 1900s. It could be said that the first exposure of Buins to the outside world and its wealth and technology was during the early 1900s, followed by WWI, and especially during WWII when Buin suffered the greatest damage on Bougainville (Nelson 2005: 182, 195). In terms of agriculture, heavy damage was caused by allied bombings which destroyed coconut groves and food gardens. Thus agricultural development, compared with other areas on Bougainville, was slow to pick up. Up until 1950s and 1960s, agricultural development was very slow to proceed. The Buins' experiences with export cash cropping seem to have provided an impetus for active cocoa planting in a changing economy where demand was continually being created for new goods as lifestyles and values changed.

The Second World War and Buin Economy

By 1940 many Buins and other Bougainvilleans had signed plantation labour contracts (Nelson 2005: 174). Moreover the late 1930s and early 1940s were a period of very low copra prices (especially 1939 and 1940-41) and, hence, of declining plantation income (Elder 2005: 159). Coupled with this was a shortage of shipping to the island to pick up copra due to the war in Europe, and the number of Bougainvilleans working on plantations gradually declined (Nelson 2005: 173-4). Accordingly, many Buins as well as other Bougainvilleans, went home during the 1940s. Many returning labourers bought goods like bicycles with the cash accumulated from plantation work (Nelson 2005: 175).

Contemporary Buin Cash Economy

The German pioneers established a plantation economy. The cash economy followed the establishment of the plantations, their attendant tradestores, and the head tax, all of which changed the traditional modes of exchange. Trading in copra from a limited number of smallholder coconut plantings gradually increased, stimulated by the use of cash, and shell money was supplemented with silver coinage largely introduced by labourers who had returned to their villages after their plantation contracts had expired. Agricultural development in Buin and Bougainville generally was slow because the German colonial administration was interested in running its own plantations, and smallholder cash cropping was never officially encouraged (Connell 1978). In addition, the missions had promoted the spread of literacy among the young men working on plantations. People found themselves confronting and absorbing new ways. The late 1950s and early 1960s saw many Buins become involved in cocoa and coconut plantings upon settling at home after working on plantations, and by the 1980s Buins had become predominantly smallholder cocoa producers.

5.7 Contemporary Agriculture in Buin

As in the past, agricultural economic activities still remain central to the economic life of Buin. Farmers in Buin, like farmers in other districts, grow both cash and food crops. Agriculture in Buin is similar to that in other parts of Bougainville with a reliance on sweet potato, banana, Chinese taro and other vegetables (see pp.74-5).

Marketing of Food Crops in Buin

Currently, many women sell bunches of bananas and sweet potato at the market in Buin town, while some sell chickens, wild fowl eggs and possum (Chapter 6: Table 6.4, p.115). The sale of food crops is limited by lack of demand, due to the collapse of government services during the Civil War, relatively high cost of transport and, security issues.

Farmers in Buin also raise domesticated livestock such as pigs, ducks and chickens, although on an irregular basis. They are raised for consumption and sale. Game animals, especially possums, may be hunted for household consumption or sale at road-side and town markets. In 2005, possums were priced between K5-K10, each according to size, while cooked shrimps fished from local rivers were sold within the price range K0.10-K1 each. Sometimes women give away unsold produce at the end of the market day. They may also sell produce at a discounted price to relatives or friends, especially if it is nearing the end of the day at the market.

5.8 The Impact of Civil War on Buin Life

Buin was a thriving township when the Civil War began in late 1988. Cocoa was the major cash crop before the Civil War and is now gradually being restored.

The Bougainville Civil War had a considerable impact on the area. Many people were displaced or lived in PNG government-run care centres. More than half of the cocoa plantings were destroyed by weeds due to neglect during the war (Cocoa and Coconut Baseline Survey on Bougainville 1999). Food gardens and cocoa blocks have been firmly re-established since the end of the war, especially since 1996 and 1997 when large scale replanting programmes were initiated by the UNDP and AusAID.

5.9 Development of Cocoa Production in Buin

Most Buins and other Bougainvilleans were employed on plantations on the east coast of Buka, especially before the mid-1940s (Connell 1978: 49), prior to their active involvement in cocoa cultivation. The only European plantation in southern Bougainville was Toburuai in Buin established in 1930 (Connell 1978: 54-5). Their involvement in cocoa came much later than their involvement in the copra trade which goes back to around 1894-5 or 1903 (Connell 1978: 49). Cocoa was successfully introduced into Buin by Catholic missionaries about 1959 and by a returned plantation worker before 1960, and, the area by the early 1970s, according to Moulik (1977:10 cited in Treadgold: 18), accounted for about half of the indigenous production of cocoa on Bougainville.

Prior to the Bougainville conflict, cocoa was the main source of income for Buin's population and most households were involved in cocoa production, while small quantities of copra were also produced and sold (Bourke and Betitis 2003). Cocoa has been particularly important in the village agriculture of the district and Buins working at the Panguna mine in the early 1970s tended to temporarily forgo wage employment during high cocoa prices and peak production periods (Bedford and Mamak 1976: 181, 176). At that time cocoa and copra contributed over 80% to the total farming household incomes in the district (Moulik 1977: 35).

Generally, production potential for cocoa is moderate for Buin, compared with areas like Tinputz and Wakunai (Bourke and Betitis 2003: 6), but it remains the dominant tree cash crop in Buin. The branch manager for Agmark in Buin reported that 18,000 bags of dried cocoa beans were shipped out of Buin in 2002 by Agmark (Dominic Nunu, pers. comm., March 2005). It was expected, at the time of fieldwork that 24,000 - 30,000 bags would be shipped from Buin to Rabaul during the 2004-05 cocoa year. This amount was expected to increase significantly as more trees (mostly planted since 1995-96) come into production across Buin and also as law and order is more firmly established.

5.10 Overview of Study Site: Iamaru Village

Iamaru village has a population of 314 people and is located in the coastal floodplains of the district, in the class of moderate agricultural pressure, with low density sweet potato gardens (Hanson *et al.* 2001a: 283, 286-88). It is located in the east of the Buin sub-district in the southern foothills of Mount Taraka in the Crown Prince (Deuro) Range, some 15 km from the Buin town district centre, and about 0.4 km away from Muguai Catholic sub-parish (Figure 5.3; also Figure 4.1, Chapter 4, p.55). Administratively, Iamaru lies within the Konnou Coastal LLG area (Appendix 3). The village has road access and lies between the Muguai sub-parish and the main highway running from Buin to Arawa, the Provincial centre.

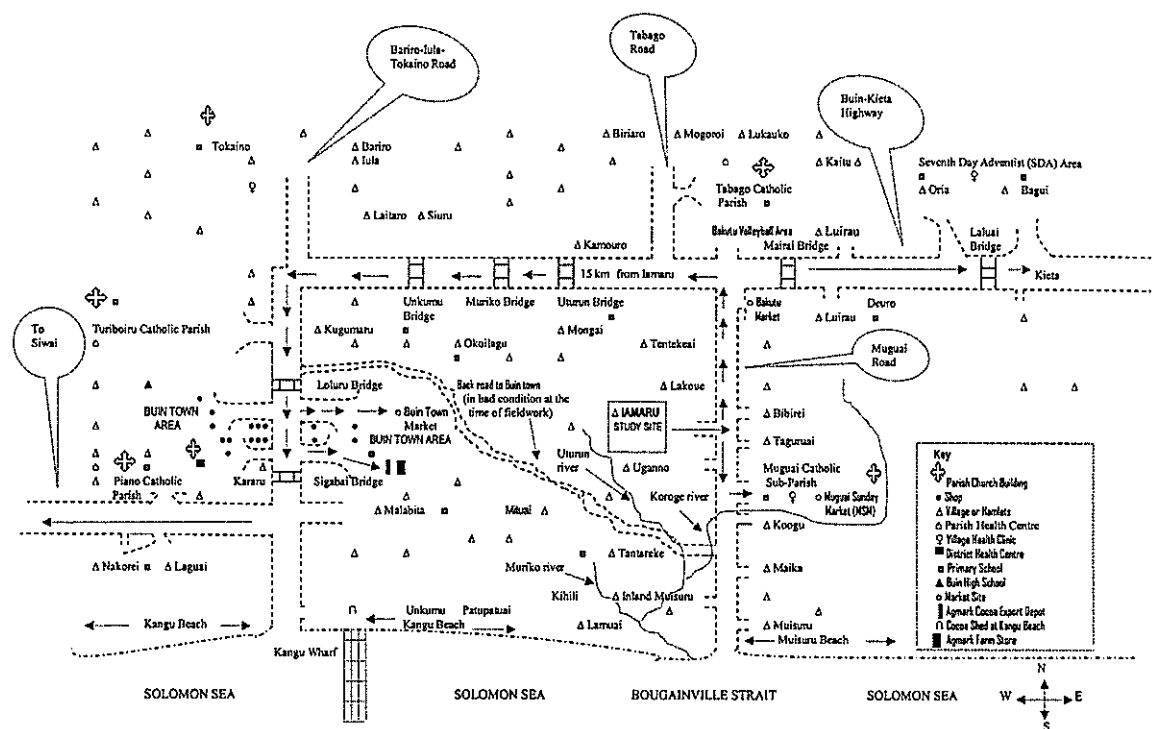


Figure 5.3: Sketch of the Study Site (Source: Author; Note; approximate distance from Laluai bridge to Piano = 35 km)

Household Units

Sample households were extended family units, usually brothers and their families living in hamlets of three to five houses. Other co-residents included parents and grand-parents and sometimes uncles, nephews and in-laws. Co-resident families liberally share use of farming assets such as cocoa hooks, bush knives, grass knives and machinery such as chainsaws. They also share garden food. They assist each other in meeting social and financial obligations, notably school fees and other expenses such as funeral ceremonial obligations, brideprice payments, medical expenses, and other cultural obligations. They will often pool resources such as cocoa beans if a family member has pressing needs such as payment of school fees.

Like other Buin villagers, in pre-mission times, each family or group of related families lived in its own clearing in the forest in isolated hamlets, and women used special trails for getting water and firewood and for reaching their gardens which men were not permitted to use (Thurnwald 1936). Villagers have retained some

aspects of their traditional lifestyles. The village contains, for example, 15 hamlets all within 2-30 minutes walking distance of each other. These are scattered but located along river banks or small rivers and are all within 2-5 minutes walking distance of rivers for bathing or washing of household utensils and clothes.

Table 5.6 summarises the socio-economic and demographic characteristics of households in the study. The average household size is comparable with the average household size in Bougainville of five members (Lummani 2005). Male household heads are slightly older than their wives. Men tend to marry at an older age than women because they need to accumulate wealth for brideprices. However, household size alone does not seem a good measure for comparing households, because their capacity to produce depends on the age structure of households as well as the number of persons within them.

Most farmers were fairly literate, with an equal mean number of years in school for both male and female household heads. Farmers had few farming assets at the time of the fieldwork since they were in the process of fully re-establishing their farms after the Civil War.

Ten farmers had vehicles, and some had private or part ownership in processing facilities. All households were cocoa growers and all had coconut palms although copra sales are much less compared with cocoa. There were only two household copra driers for farmers both in neighbouring villages but some farmers dry copra in their kitchen houses, particularly when copra prices rise and no drying facilities are available. Cocoa production was picking up towards the end of March 2005, with the beginning of the first cocoa season in Buin which runs from April to May. The second one runs from August to September, while the major cocoa harvest periods are July and October.

Table 5.6: Household Demographic Characteristics and Assets

Age	Age in Years (N= 36)
Mean age of male household head	41 years
Mean age of female household head	35 years
Household Education and No. of Children	Educational Level and No. of Kids
Mean no. of years in school for males	5
Mean no. of years in school for female	5
Mean no. of children/household	4
Household Cocoa Assets	Cocoa Asset Details
Mean no. of cocoa trees	1,401 trees
Mean no. of cocoa blocks/household	2 blocks
Mean ha/household	2.04 ha
Status of Land on Which Cocoa is Planted	% of Total No. of Households (N=36)
Customary land	97.2
Purchased + customary land (mixed tenure)	2.8
Common Tools	% of Households Owning Each Tool
Cocoa hook	83.3
Bush knife	86.1
Sariff	86.1
Axe	80.6
Spade	69.4
Working Condition of Tools	% of Total No. of Tools (N=322)
Very good	13.4
Good	70.4
Poor	15.8
Vehicle and Processing Facility Assets	% of Total No. of Households (N=36)
Own vehicles	27.7
Part-owner in processing facility	41.7
Private processing facility	2.8
Has copra processing facility	5.6

The Socio-Cultural Life of Villagers

Most Iamaru farmers settled in Iamaru village through marriage from the Muguai area, and were descendants of clan nos. 2 and 4 (Figure 5.4), while a few were from different clans. The village as it exists now was forced together under the colonial administration after the Second World War. The villagers could not easily recall which clans are represented in the village. Many villagers do not know their family trees. Some villagers were claiming incorrect membership of different clans when the importance of clan affiliation and lineage became more important during the revival of the traditional chieftain system of government following the Civil War. But in the village, families do occasionally help one another in daily activities such as sharing food, construction of houses, slashing cocoa blocks, preparing housing materials, financial assistance, attending to community obligations, mediating family disputes/in-fighting, and providing health care to villagers. Thus, cooperation cuts across clan boundaries.

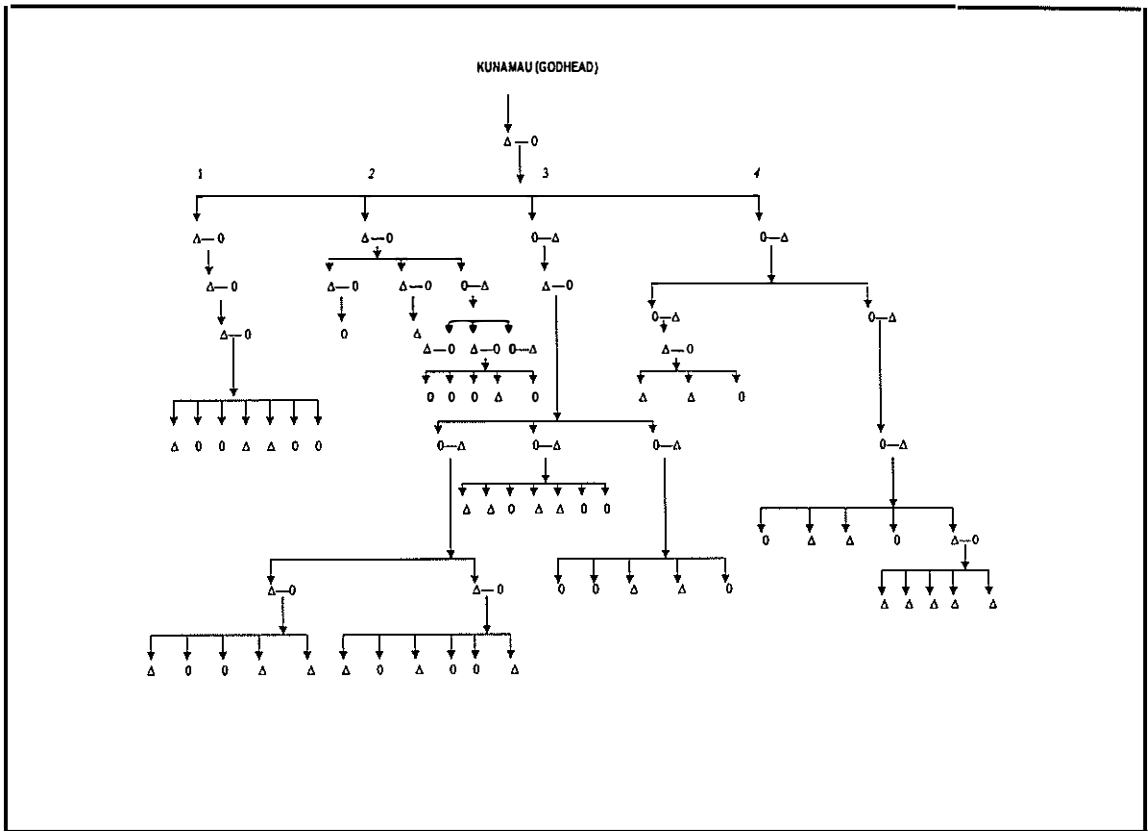


Figure 5.4: Idealised Picture of the 4 Clans Iamaru Villagers Descended From (Source: Author)

All households are headed by males. In Iamaru village, households headed by women are uncommon and tend to be those where the husband has died and the widow has not remarried.

Before the Civil War from 1988-1996, some Iamaru villagers had modern assets such as buildings, tradestores, vehicles, chainsaws, motorbikes, bicycles, musical instruments and many other modern material goods. During the Civil War many of these goods were lost and people reverted to much more “traditional lifestyles”. Since the end of the Civil War, Iamaru villagers have been rebuilding their lives, but progress is slow. Most Iamaru villagers live in bush material houses (Plate 5.1).



Plate 5.1: Typical Bush Material House

It will take some years before savings are accumulated to buy materials to build permanent houses. Furthermore, during the Civil War, traditional activities like funeral payments were suspended. For many households, repaying these “traditional” obligations have priority over building permanent housing. Often traditional activities and expenses like school fees also have priority over buying permanent materials for housing. So priorities concerning use of cash vary among households, with many households using cash income to settle matters of social and cultural importance such as funeral payments, life crisis-matters or school fees, with the result that less money is re-invested in housing or farming.

Some villagers of earlier generations were relatively better educated than today’s youth. However, many young villagers since the late 1970s were seduced by the idea that the main purpose of education was to generate money and acquire material goods. The 1960s to the 1980s, was a time of profound social change in Bougainvillean society generally (Ogan 2005; Bedford and Mamak 1976; Connell 1978; Regan 2005). These changes enticed many to plant cocoa so that they could acquire desirable modern goods.

Those who planted cocoa earned relatively higher incomes, especially from the mid-1960s until early 1970s when crop prices were high (Figure 5.2, p.80). Young villagers bought many items such as cassette players, jeans, jackets, musical instruments (acoustic and electric guitars and amplifiers), western country and rock and roll cassettes, shoes, watches, spectacles, cameras and beer. Some ordered Yakka clothes from Australia while others brought pornographic materials from friends in Arawa, the Provincial centre, and also sought to seduce young women with money. In the face of rapid social change, parents found it difficult to instill discipline and ensure the transmission of values, acquired from cultural traditions and through education, provided by the Catholic missions. Such a social situation, no doubt, may have contributed to social breakdown before the unfortunate destruction associated with the Bougainville Civil War.

Since 1996, there have been large enrolments at Holy Family Muguai Community School as young men sought to make up for missed educational opportunities during the Civil War (Kangki, senior teacher, pers. comm., March 2005). For this reason, earlier enrolments after the Civil War included young adults as old as 18 and 20 years of age who wanted to improve their literacy levels. Some adult students married after reaching Grade 7 and 8, while others progressed further until Grade 10. However, many students were discouraged by high school fees which range from K60 to K80 at the primary level and up to K1,000 at secondary school level (see Chapter 6, p.113). Now, the children of Iamaru villagers attend the above mentioned school which provides education up to Grade 8. The number of children attending school is increasing not only in line with rising household incomes, but as more people come to recognise the value of education since the end of the Civil War.

There is a small health clinic staffed by two nurses at the Muguai community school where people from surrounding villages go for medical services. The clinic was built by AusAID in 2000 as part of its restoration activities on Bougainville. The main health centre owned and run by the Catholic church is at Tabago parish. It is about 5 km from Iamaru village, and villagers with serious illnesses go there for drugs or services that are unavailable at Muguai. The district health centre is located at Buin town.

5.11 Overview of Cocoa Production in Iamaru Village

Cocoa farming is the main tree cash cropping activity for Iamaru villagers. There is still ample land although it is not shared equally because of the system of land tenure, but the farms continue to provide for the increasing needs of villagers (Chapter 7, pp.122-3). Cocoa farmers occasionally require use of extended family labour, and involvement in cooperative activities within families and amongst friends, relatives and kin is common (Chapter 7, pp.124). Like other PNG smallholders, Iamaru farmers involve themselves in a range of activities to supplement their incomes from cocoa and also depend on their network of relationships for support, especially when poor world cocoa market conditions persist (Chapters 6).

For Iamaru villagers, as for other farmers on Bougainville, cocoa farming grew and continues to grow in response to their growing cash needs as people become caught up in an increasingly monetised economy (Chapter 7, pp.126-131). Obviously, the use of cocoa production not only reflected the colonial government's encouragement of smallholders to plant cocoa following WWII, but also reflects the fact that smallholders had access to sufficient land (p.77; Chapter 7, pp.120-1). This social structure where smallholders own customary land allowed for the development of extensive cultivation of areas of land for production of cocoa to meet their growing cash needs and obligations in new situations (Chapter 7, pp.122, 126-131). As Connell (1978: 164-78) pointed out, high prices in the mid-1960s and subsequently, encouraged the increase in smallholder cocoa farms. In Iamaru village, it is unlikely that a typical household could, after meeting its subsistence needs and social commitments, have enough time to properly maintain more than 2.5 ha of cocoa. It is the case, however, that some farmers expand the area planted to cocoa so long as land is available, sometimes going beyond their family's capacity to adequately maintain and harvest established cocoa blocks.

Iamaru villagers sell their cocoa wet beans along local feeder roads and in the village. Because of the dealers' close proximity to households, and the small quantity of cocoa sold by growers, it was not difficult for people to take cocoa on

foot to buying points. The villagers processed cocoa and wet beans are marketed without government interference but local prices are driven by international prices, not by local supply (Chapter 3, pp. 44-5). For wet cocoa beans, there is a set price per kilo at each buying point, but in terms of dried cocoa beans, growers have no choice because there is only one buyer – an exporting company in town (Agmark).

Because of the lack of banking services, farmers must cash their cocoa cheques in stores in Buin town. But most stores require people to spend 30% of the face value of the cheque in the store to cash them. This means that it is difficult for farmers to save their income from cocoa. Many Iamaru farmers have hardly made up for the lost value by trading their cargo acquired by cashing cheques.

5.12 Summary

Given the relative suitability of its geographical and agricultural features, agro-climatic conditions, Bougainville, like other Melanesian societies, is a changing society, with increasing integration into a wider cash economy, with egalitarian values persisting in peoples' lives. Village farmers manifest such values, for example, in terms of solidarity in relation to social and economic security under circumstances such as changing market conditions (i.e., in terms of changes in cocoa prices, supply and demand) and in other adverse circumstances of life such as the Civil War and/or life-crisis situations.

Iamaru cocoa households have not diversified agriculturally into alternative tree cash crops, and, although most interplanted cocoa with subsistence crops, their livelihood is generally dependent on cocoa. Overall, life has not been easy for Iamaru villagers since resettling in the village after 1996. Since then, with virtually no cash income, a large portion of the villagers' time was spent on establishing new gardens, building houses and rehabilitating cocoa blocks. Rehabilitation of cocoa blocks and the planting of new cocoa holdings were continuing during my fieldwork.

In the following chapter, I discuss their household economy in relation to their lifestyle based on my fieldwork data, particularly in terms of supplementary income earning activities to meet cash needs in the context of their changing lives.

CHAPTER 6: THE IAMARU HOUSEHOLD ECONOMY

6.0 Introduction

This Chapter discusses non-cash crop sources of household incomes in the context of Iamaru village socioeconomy. The information presented on the Iamaru village economy is derived from surveys of 36 households over a 12-week period in 2004-05. The methods are described in Chapter 4. The chapter begins with a description of the characteristics of farming household assets and is followed by an analysis and discussion of the sources of cash income, their relative importance in the village economy, and the main areas of income and cash expenditure. The final part of the chapter discusses how assets and cash move through market and non-market exchanges. The chapter continues the farming systems approach taken in Chapter 5, recognising the diversity of household income sources in addition to cocoa. The farming systems approach is useful because it throws light on the capacities and needs of farmers in the production and marketing of cocoa and their significance for the community's socioeconomic well-being. In the commodity-based approach, productivity and efficiency aimed at profitability are taken as prime concerns for households regardless of whether this logic corresponds with the realities of the farmers' lives. But even economically, for some smallholders, when struggling to earn income derived from natural resource-base activities, their timeframe for making decisions may be limited as is their capacity to plan for the long-term. In fact, for the majority of poor farmers, their priorities are for meeting short-term goals and social obligations, so that profit/economic incentives alone, may not be sufficient for inducing farmers to increase productivity (Vanclay 2004: 214).

6.1 The Pre-Civil War and the Present Situation

The pre-civil war symbols of economic development in Iamaru village included tradestores, some privately owned vehicles and cocoa processing facilities, together with relatively independent ownership of cocoa and coconut palms. Infrastructure included bush tracks and WWII Japanese roads running alongside cocoa blocks leading to a trunk road. Private businesses, cash crops and infrastructure were largely destroyed during the Civil War. Although change has been considerable, including a strengthening of links with the modern world through education, government services and participation in the monetary economy through cash crop cultivation and some wage employment, many elements of culture have been retained in the social and economic realms. For example, villagers are still to a large extent dependent on subsistence production, and indigenous social structures continue to manifest their influence in various ways on people's economic decision-making, commercial activities and other areas of life (Chapter 5, pp.78-9, 85-9).

6.2 Cash Income in Iamaru Village in 2004

For most male household heads, cocoa is their main income source and, at the time of fieldwork, 75% of them reported it as their primary source, while 25% were deriving incomes from other sources. The latter group were awaiting full maturation and bearing of their cocoa trees, or completion of the rehabilitation of their blocks.

The main sources of income other than cocoa for males include: pigs, tobacco, fish, pineapple, aibika, wild animals (possum), chicken, and banana. Six of the ten households with vehicles also reported contributions to household income from their transport business, while three households with tradestores reported contributions to total household income from said assets.

Given the limited cash incomes in the Buin area, many Iamaru villagers were generating supplementary incomes from a range of sources.¹ Figure 6.1 shows mean annual household cash incomes by source. The figure includes income from cocoa and other contract and freelance work income (which was minimal) in the village. Excluding income from contract and freelance work, to focus on more regular

income sources, mean annual household income from local markets, pigs, chickens, fish, kerosene, rice, noodles, biscuits and cocoa amounted to K2,543. This figure has been inflated to some extent by the income of two people who earn income from regular tradestore activities in the village. One made an annual income of K4,500 in 2004, while another made K500, both of which were relatively higher than the cash incomes of other villagers. Five households earned incomes from occasional contract work and, one from freelance activities. If these atypical incomes (trade stores, contract work and freelance activities) are removed from the calculation, the mean household income of the 36 households is K1,444. This equates, based on the average sample household size of 4, to about K361/person/household/year. This is higher than Hanson *et al's* (2001: 285) estimate of per capita income for Buin of K40-K100/person/year. The mean income for Iamaru villagers may reflect improved opportunities to earn cash and the reduction in the constraints on income generation activities because of a better security situation, as well as the increase in cocoa rehabilitation and planting since the end of the Civil War.

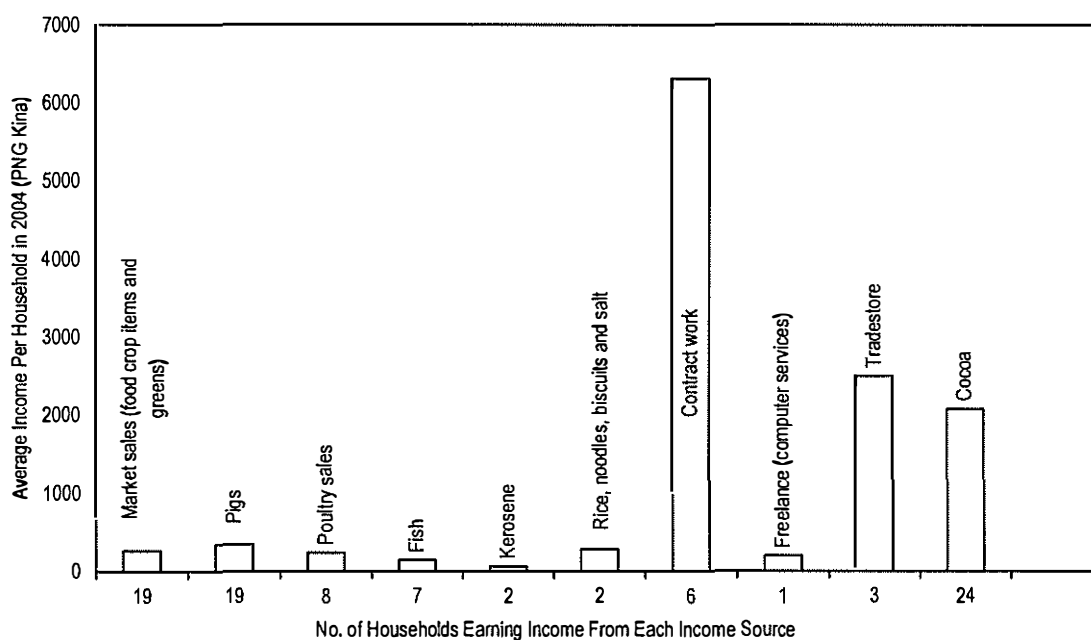


Figure 6.1: Village Income Sources in 2004

Non-Farm Agricultural Incomes

Off-farm income sources reported at the time of fieldwork included: pre-school teaching, nursing, video showing, sign writing, sawmilling, freelance electronic services and contract work (e.g., building sleeping houses, cocoa fermentaries, and electrical wiring in shops and church buildings). Some skilled non-farm work like electronic and electrical services follows from the reconstruction after the Civil War.

Of the six households who had members earning incomes from occasional contract work activities and freelance work, three households received a total of K5,830.33 in 2004, from work related to construction of a cocoa processing facility and residential buildings for other households. A fourth householder with a vehicle (Toyota 4 x 4), contracted it out for government runs taking supplies to Buin LLG for which he earned K8,000. A fifth person and the youth group he supervises, was involved in electrical and sawmill contract operations, and had installed an electrical wiring network in a new church building at the Tabago Catholic Parish for K4,000.² A sixth person was involved in providing freelance computer and electronic services for individuals living in Buin town, high schools, government workers, and private contractors. He earned K200 in 2004 by servicing a computer for Buin Provincial High School. The incomes from these activities were higher than those of most other villagers.

6.3 Tradestore Sales

Table 6.1, based on farming households #2, 4, 21 and 34, represents typical tradestore food prices in Iamaru village. The basic items sold include 1.5 volt batteries, salt, noodles, torch bulbs, cordial, Milo and tinned roasted duck. Items such as tinned fish and rice are bought occasionally when villagers have spare cash, while cordial, sugar, tea and Milo may go unsold during non-flush periods. This also explains the low levels of tradestore sales in non-cocoa flush periods coupled with delayed credit repayments. However, according to the farmer shown on Plate 6.1, business is best during the cocoa seasons when most customers also pay their outstanding debts.

Table 6.1: Typical Tradestore Prices in Iamaru Village

Item	Price (PNG Kina)
Kokonat Biscuit (4 pieces)	K1 ea packet
Cup Tea (3 pieces)	K1 ea packet
Arrow Roots (4 pieces) (100g net)	K1 ea packet
Roots Rice (1 kg)	K3 ea packet
Kerosene (333 ml beer bottle)	K1.20 ea
Sugar (small packet) (150g net)	K1.50 ea
Tinned Corned Beef	K6 ea
Tinned Mackerel (0.415 kg)	K4.50-K5 ea
Salt (Small packet)	K3 ea

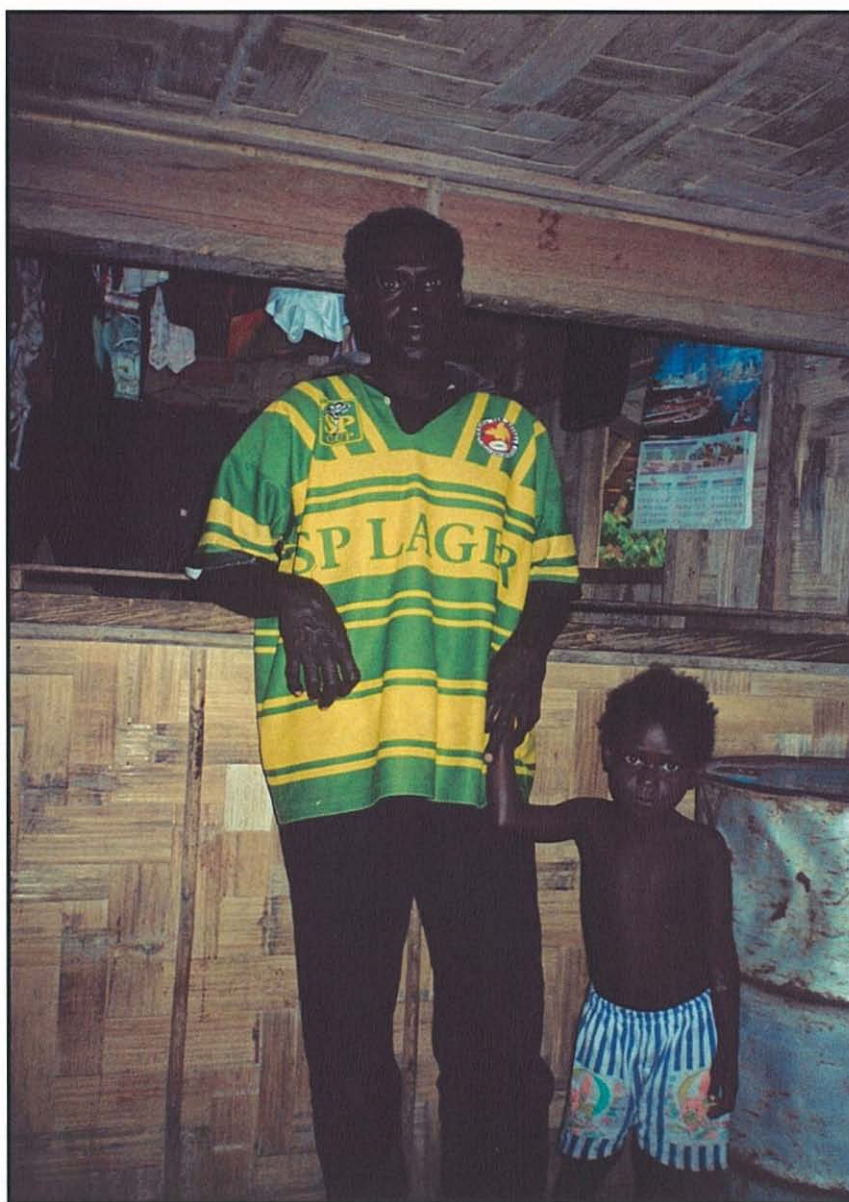


Plate 6.1: Farmer and Daughter in Front of Their Tradestore

Use of Tradestore Money

The money generated from tradestores is used for a range of purposes. For example, the farmer in Plate 6.1 uses the money from his tradestore to pay school fees for his and his deceased brother's two children. Before fieldwork, he also used the tradestore income (K800) to finance a construction of a new cocoa fermentary with his maternal uncle, and at the time of fieldwork, he contributed K50 to a relative's brideprice payment.

6.4 Local Markets

In 2004, income from marketing represented 51% of total income (excluding income from cocoa, tradestore, freelance contract work and pigs). Although an occasional activity for some households, it has been an important supplementary income source for families in the immediate aftermath of the Civil War (see, for example, *Tinputz Local Market*, Plate 6.2), while waiting for their cocoa trees to mature.

Most Iamaru female household heads market at the Bakutu Roadside Market (BRM) held every Friday, within half an hour's walk of the village and, at the Muguai Sunday Market (MSM). Due to transport difficulties lesser amounts of produce are sold at the Buin Town Market (BTM) (Figure 5.3, Chapter 5, p.95). Lack of reliable transportation has been a main disincentive for females marketing their food crops at the BTM. BTM is a better market because of the government employees stationed there.

In addition, BTM is also situated close to some villages with land constraints such as Kugumaru and Laitaro, whose inhabitants often make market purchases. At the time of fieldwork, females attending BTM, would wake up at 5 am and walk the 15 km carrying market items along a poorly maintained feeder road (Figure 5.3). The vehicles in surrounding villages were mechanically faulty and their runs to Buin town were very irregular. The mostly owner-operators may make runs to BTM only if asked by market goers.



Plate 6.2: Tinputz District Local Market

At the time of my fieldwork, two female household heads were involved in marketing activities on a weekly basis, and 17 of them on an irregular monthly basis. Six female household heads were not involved in any marketing activities at the time of fieldwork, while two young farmers had no wives. Some male household heads stopped their wives from attending markets because of the risks associated with sporadic clashes between young men, and the presence of rebel elements wandering around with hidden guns. Thus, although females may have readily available food crops, cash income choices were limited, sometimes for personal household reasons.

For female household heads involved in marketing activities, their sources of income ranked in descending order of importance are: cooked cassava, tobacco, sweet potato, banana, greens, peanut, flour, pineapple, and betelnut.³

Tobacco (Plate 6.3) was an important income source for most households at the time of fieldwork. Like betelnut, it is socially important in villagers' lives for those who smoke it when they work on cocoa blocks or when they go hunting,

fishing, or at social gatherings. Villagers dry and store tobacco leaves in their kitchen bungalows for sale when it becomes scarce.



Plate 6.3: A Farmer with Tobacco Plants (left), and Drying in Garden Shelter (right)

Because of the seasonal pattern in garden food production, households which keep pigs and chickens are subject to less intense fluctuations in cash incomes than households relying mainly on garden food crops for cash incomes. Also Iamaru households maintain large banana stands for cash and also because of their year-round availability and durability, in contrast to sweet potato which rots quickly in wet weather. Coconuts are rarely sold at local markets because of the plentiful supplies around Iamaru, except in high altitude upland areas. Some villagers have betelnut palms for home consumption, but it is not intensively sold, compared with areas around Buka and the Gazelle Peninsula (Lummani 2001). However, it is expected that sales of such items will rise with full restoration of feeder roads, government services, increasing frequency of people's movements, and the greater availability of cash.

Sales of processed food are very limited and notably include flour balls and stone-oven cooked cassava. This situation is likely to change with the gradual

improvement in the law and order and economic situation of Buin. Cassava cooked in stone-ovens is popular with school children, young men and women attending sporting activities on Fridays and Sundays, and is frequently eaten with smoked fish sold by fishermen from Muisuru village (Figure 5.3, Chapter 5, p.95) along the coast. Small fish are sold at K0.50-K2 each at the local markets. Based on fieldwork observations, expenditure on processed foods and goods is low.

Income from Pigs, Meat and Poultry

Traditionally, pigs have always been of central importance in Buin culture (see for example Thurnwald 1934, *Pigs and Currencies in Buin*). Before the Civil War, free-ranging pigs were banned from the village by local community government regulations because of garden damage and for hygiene reasons. If foraging pigs damage other people's gardens, the owners are fined. If not, the pig is killed by the garden owner, following three warnings from the local government after reports from the garden owner. After Iamaru households resettled in the village from government and rebel-controlled areas during 1996-1999, pigs and poultry have become good income sources (Figure 6.1, p.105). At the time of fieldwork, many households were keeping one to three pigs, some in enclosures and others free-ranging. Local chickens, as well as *didiman* (hybrid) chickens were raised and sold. Poultry businesses have slowed because of theft by unruly youths.

Beside the traditional social, cultural and economic reasons for pig husbandry, pigs serve as a good source of income while waiting for cocoa trees to mature. However, because pigs provide cash in lump sums with demand almost always assured because of its cultural importance (e.g., life-crisis situations, deaths, marriage, and acts of reconciliation), some households have chosen to establish piggeries.

6.5 Wage Labour

Eight Iamaru villagers were in full-time paid employment (government employees), although not one was a participant in the study as most lived outside the village. Three of them lived in the village, one in central Bougainville, and the rest in other areas of PNG. Of the two male village employee residents, one is a pre-school teacher, while another is an elementary school officer in the Buin District Centre (BDC). The female who lived in the village taught grade three school children. Remittances from those who reside in other parts of PNG were negligible, but have occasionally provided assistance in the form of agricultural tools, clothes, financial assistance with education and the meeting of cultural obligations.

Some village income was generated by the Iamaru youth group from various activities. These include: slashing of cocoa blocks, preparation of housing materials and house construction, transportation of housing materials and firewood, and slashing grass on feeder roads. The group is usually paid K15/hour or K30 to K100 per day flat rate. The aim of the group is to raise funds for meeting the club's needs such as the purchase of soccer balls and uniforms and also to keep youths from wayward behaviour such as drinking locally manufactured alcohol known as "homebrew."

6.6 Household Expenditure

School Fees

School fees are an important expenditure item for all households. They increase with the grade of education. Table 6.2 (p.113) shows the maximum levels of school fees charged to parents in PNG in 2006. As for families elsewhere in PNG, for Iamaru villagers, school fees are an important reason for income generating activities, including cocoa production. Most villagers incur education costs in the range of K100-K250, but earning this amount is not easy with very poor yielding cocoa trees, coupled with a relatively large proportion of immature trees (Chapter 7, p.123-4).

Table 6.2: Recommended Maximum Fees in PNG Kina Per Child in 2006

Level of Education	Fee (PNG Kina)	Boarding Students (PNG Kina)
<i>Primary Schools</i>		
Elementary-Grade 2	K100	
Grade 3-6	K150	
Grade 7-8	K250	
<i>Secondary Schools</i>		
Grade 7-10	K700	K1,100
Vocational	K700	K1,100
Grade 11	K1,200	K1,600
Grade 12	K1,200	K1,600
CODE Students	K80/Subject	
<i>Pre-service Teacher Training at PTC/PNGEI</i>		
HECAS-sponsored Students	K750	
Self-sponsored Students	K1,127.50	
Self-sponsored Boarding Students	K3,125	
<i>Technical Colleges</i>		
TTC (44 Weeks)	K2,800	K4,600

{Source: National Education Board (NEB), Port Moresby, PNG; HECAS (Higher Education Contribution Assistance Scheme); CODE (College of Distance Education); TTC (Diploma or Technical Training Certificate); PTC/PNGEI (Primary Teacher's College/PNG Education Institute). Note; The NEB sets maximum fee limits in order to guide provincial education authorities and the department of education divisions in setting fees which should not be more than the set limit}

In light of the average annual household incomes of K1,444 (cf. Omuru *et al.* 2001), paying school fees for several children and other associated expenses, coupled with buying household items after the Civil War, is difficult for many parents. While parents with sufficient funds can make upfront school fee payments, most Iamaru villagers make part-payments over time, in line with overall advice from the Provincial education authorities. High expenditures on school fees cut across PNG (Lummani 2001; George 1994). As an important item of expenditure, it reinforces the point that, in rural societies, cocoa production occurs more to meet immediate household needs rather than being driven by a desire for profit maximisation (Chapter 2, p.15; Chapter 7, p.138-142).

Table 6.3 shows the number of children from Iamaru sample households at each level of education during the fieldwork period.⁴ The adult children not in school mainly consist of married offspring and early school leavers.

Families stressed that the rising production of cocoa with full restoration of peace and security would improve their financial capacity to meet their children's

education and other needs. However, they do not seem to be concerned by or are unaware of the potential of improving farm productivity to raise their incomes.

Table 6.3: Children of Sample Households in Schools (N=36)

Level of Education	No. of Children	% of Total Offspring
Elementary	18	11
Primary	58	37
High School	27	17
Tertiary	3	2
Not in School (< 7 years)	41	26
Total School Children	88	56
Adult Children not in School	29	18
Total Sample Household Offspring	158	100
Average No. of Children in Education Per Household	2	-

Most parents want their children to seek non-agricultural jobs with better education, as illustrated by a villager who commented in relation to an educated resident villager at the time of fieldwork:

...we don't know what he is doing here in the village and why he has stayed so long at home. The job he has been trained for must be very different from yours (referring to interviewer). We would have thought that he would be working somewhere rather than staying in the village. The village is for us (#10. 26/01/05).

Moreover, some writers (e.g., Heidhues and Bruntrup 2003: 1-27) note that human capital formation (sending children to school, particularly in the poor rural areas of the so-called developing world), could also be a diversification move out of agriculture, to be able to assist their families in overcoming poverty and stressful situations, especially in sub-Saharan African countries where, more often than not, natural disasters like drought exacerbate peoples' hardships. Nevertheless, in some areas of developing countries, primary education has been found to have had a stronger impact on farm productivity than higher level education (see for example Kurosaki 2001; Kurosaki and Khan 2006; also for household studies worldwide, see IFPRI website: <<http://www.ifpri.org/search>>).

Garden Food Crop Produce and Expenditure

In Iamaru village, as in other rural societies in PNG (Allen *et al.* 2000), although the role of clan groups over many areas of life is weakening, it is still strong in relation to access to land by ensuring that land for subsistence and cash cropping is available to all clan members who require it. Food crops sold at local markets and export cash crops (mainly cocoa and coconut) are all grown on customary land and, as in other parts of rural PNG, the village economy is still very much a part of their social life although changes are occurring. Table 6.4 shows the average price (costs) of fruit and vegetables and animal products at local markets.

Table 6.4: Price of Items Sold at the Market by Household Members

Food Crops, Nuts, Fruits, and Other Items	Price (PNG Kina)	Weight (kg)
Cooked cassava (<i>Manihot</i>)	K0.30 ea wrapper	0.090
Loose processed tobacco (<i>Nicotiana tabacum</i>)	K0.20 ea leaf	0.005
Processed braided tobacco	K2 ea braided roll	0.09
Sweet potato (<i>Ipomoea batatas</i>)	K6 ea bunch (10 pieces)	5
Banana (<i>Musa sp.</i>)	K6 ea bunch (6 pieces)	2.5
Greens (pumpkin tips, aibika and ferns)	K0.30 ea bundle of 40 tips	0.61
Peanut (<i>Arachis hypogaea</i>)	K0.20 ea bundle	0.65
Fried flour (<i>Farina</i>) roll	K0.30 ea	0.060
Pineapple (<i>Ananas comosus</i>)	K1 ea	1
Betel nut (<i>Areca catechu</i>)	K0.20 ea	0.12
<i>Livestock (Depends on size)</i>		
Fully grown live pig (<i>Sus domesticus</i>)	K200 ea	158
Strips of butchered pig meat	K4 ea strip	2.5
<i>Poultry</i>		
Live rooster (<i>Gallinaceus</i>)	K13 ea	2.5
Live hen "	K7 ea	2
<i>Wild Animals (Depends on size)</i>		
Smoked ringtail possum (<i>Phalanger orientalis</i>)	K7 ea	0.42
Cooked fresh water shrimps (<i>Pandalus, Crangon</i>)	K0.60 ea	0.0005
Cooked banana prawns (<i>Penaeus merguensis</i>)	K1 ea	0.0006
Smoked reef fish (intermediate size)	K8 ea	0.15
Smoked eel (intermediate size) (<i>Anguilliformes</i>)	K6 ea	0.10
Fresh megapode egg (<i>Megapodiidae</i>)	K0.50 ea	0.23
Cooked megapode egg	K1 ea	0.085

Note: The item prices are actual market prices observed at local markets during fieldwork while weights are estimated from fieldwork data related to the items observed on sale over the fieldwork period.

As in the case of processed foods and goods (p.111), expenditure on garden produce is low in Iamaru village. For most Iamaru villagers, the majority of items on sale at local markets are available in their own food gardens and forests. They rarely (if ever) incur significant expenses on market purchases. However, villagers may sometimes buy some sweet potato or banana when rain affects food supply across

Buin or they are waiting for their crops to mature, or when they need extra food for a social or cultural event.

During fieldwork, most Iamaru villagers visited local markets and occasionally made minor purchases of garden food crops, fruits and nuts. Typically, most purchases are for immediate individual consumption while at the market, rather than to meet household food requirements at home. The most common item of expenditure was cooked cassava, wrapped in banana leaves. Pig meat (usually cut into strips) is also occasionally sold and is bought by many individuals whenever it is available. Older people have a strong preference for pigmeat because they believe it keeps them strong. Iamaru villagers usually incur expenses on Sundays when attending church services at Muguai Catholic sub-parish which are followed by games. They also spend money when attending volley ball games at the BRM. This is especially the case with young people.

Consumption of Processed Food Items

Iamaru villagers tend to buy processed food during cocoa flush periods and at other times when levels of disposable income are relatively high such as after a good day of sales at the local market. Unlike households in the Gazelle Peninsula of ENBP whose consumption of processed food is relatively high (Lummani 2001), Iamaru villagers are mostly self-reliant in terms of food, with irregular consumption of purchased processed foods.

6.7 Indigenous Exchange Networks

As with cash income, expenses in indigenous exchange networks are part of cash expenditure. With the improved economic and financial circumstances of villagers, undoubtedly some proportion of outlays will be channeled into social and kinship obligations such as the acquisition of pigs for funeral ceremonies for deaths in the Civil War/through sickness, reconciliation ceremonies with enemies, and other life-crisis situations. As noted in Chapter 5 (pp.78-9, 85-9), egalitarian values and attitudes have become part of the changing society of the Buins. As discussed in Chapters 7-8, farm assets and expenses associated with cash crops like cocoa are

sometimes mediated through exchanges between kin and friends. These are important and for certain households such socially valuable actions could, at times, mean discounted costs of production, depending on one's circumstances. This reflects the wealth sharing aspect typical of Melanesian societies (Chapter 2, pp.22-4; Chapter 5, pp.78-9, 85-9), which is intricately linked to power and property rights over natural resources, but which, equally, can restrict farmers' profitable opportunities.

The social influences on household economic decision-making and costs of production are discussed with examples from fieldwork in Chapters 7-8, such as how cocoa income is fed into exchange networks like mortuary feasts, brideprices, school fees and day-to-day and ongoing assistance between friends. Cash has infiltrated many areas of non-market networks of exchange where it has now become necessary for fulfilling exchange obligations and satisfying various indigenous socio-political goals.

Furthermore, while cash has not completely replaced traditional items of exchange such as yams, animal protein, pandanus mats (*Malay pandan*), and clam shells (*Mya arenaria*), villagers often use cash to buy these items. Their occasional purchases of food items are dictated by their need for acquiring such items, while transacting individuals often agree upon the timing and delivery of durable items traditionally exchanged (e.g., pandanus mats and clam shells for making lime powder). Pandanus mats and clam shells cost K2-K7 each, and K6-K10 per bunch, respectively at local markets. Also, cash is sometimes used as an exchange object without intending to profit from it such as in fostering social relationships or as a sign of appreciation. These transactions are ongoing in day-to-day life such as in ceremonial exchanges and acts of reconciliations. In a broader context, the PNG national government spent millions of kina in these forms of payments helping to get the peace process moving on Bougainville.

6.8 Summary

This chapter has thrown some light on the various activities that villagers are involved in (apart from cocoa cultivation) to raise extra incomes to support themselves and to help fulfil their socio-cultural obligations. From the foregoing

discussion, it is clear that Iamaru villagers have increasingly become involved in the cash economy, with cash needs becoming an inevitable part of their socio-economic life. The interchange between the non-market and market exchange sectors is important for understanding the discussion involving social factors in relation to cocoa farm productivity, efficiency and lifestyle in the context of rural societies such as those in PNG. Indigenous social and economic relationships provide the mechanisms by which the economic actions of households are mediated which, in turn, affects households' profit-driven cocoa productivity and efficiency.

In the next chapter, I look at the social context of cocoa production in Iamaru village from two broad dimensions relevant to the context of village cocoa households.

CHAPTER 7: THE SOCIAL CONTEXT OF SMALLHOLDER COCOA PRODUCTION IN IAMARU VILLAGE

7.0 Introduction

...anyone familiar with rural areas of...agrarian nations, is immediately struck by economist's general neglect of the social and psychological context in which smallholders make production decisions... (Barret 2005: 214).

The above quote highlights the fact that attempts at increasing agricultural productivity have often ignored the role of identity and social embeddedness¹ in the conditioning of human agency.

This chapter argues that the output of cocoa work in Iamaru village is not merely about cocoa production and cash income but that it is much greater: it also includes developing and strengthening social relationships which will yield a range of social and economic benefits for the community. The social networks in the village where these cocoa producers live are like a form of insurance during hard times, not necessarily interacting with production in a direct sense, but at times helping to increase production. In PNG societies peoples' social and material well-being is bound up with giving, sharing, and the maintenance of one's identity as a group member (Curry and Koczberski 2004; Banks 2004; LiPuma 1999). This chapter investigates the social and cultural context of cocoa production in Iamaru village by examining smallholder cocoa production from two viewpoints:

- First, the material/money side of cocoa production (the cash income generated from cocoa production). This is the economic side of production where farmers are expected to perform according to market expectations: market incentives; profit motivation, better crop prices (market signals), cost conscious actions, reinvestment in cocoa farms; and

- Second, the social side of production. This is the maintenance and strengthening of relations through production activities; well-being is bound up with giving, sharing and social control; sharing of farm assets, exchanging labour and products of labour (e.g., wet beans); lending money to relatives and friends, investment in one's own and extended families' children's education so that they will help parents and family members later.

To relate the above viewpoints to the context of Iamaru cocoa farmers, I begin by discussing land and labour availability, followed by wealth and status in relation to cocoa planting among the villagers.

As for other rural villagers in PNG, 'land and labour' remain an integral part of Iamaru villagers' lifeworlds in terms of their social and economic existence (Chapter 2, pp.23-4, 26). That is, villagers use labour to work the land for their livelihoods, sharing the fruits of their labour with other families, relatives and friends, in times of need and as a means of strengthening group solidarity, identity and goodwill. Thus, even those villagers who perceived some land constraints (see Subsection 7.1, p.120-1), would not tend to be driven by economic necessity to suffer consequences associated with land shortages for growing food crops, or material inequality in terms of possession of financial and material goods in the context of village situations.

Secondly, the 'wealth sharing' dimension of village life traditionally linked to status within the chieftain system lives although under modified circumstances (Chapter 5, pp.78-9, 85-9). This is demonstrated by, for example, in terms of working members (formally employed), or simply relatively financially well-off members in the family and/or village community sharing cash with less well-off family members/relatives/friends to meet cash needs, liberally borrowing farm tools and equipment from one another, or sharing the use of symbols of wealth like vehicles (Chapter 5, p.95; Chapter 8; Chapter 6, pp.115-8). However, along the lines argued in preceding chapters (Chapter 1, pp.4-5; Chapter 2, pp.22-4; Chapter 3, pp.47-8, 52-4), although the operation of socio-cultural values among villagers may not really seem conducive to market virtues, such as thrift and the desire for profit-maximisation, they are not really impediments to increased cocoa production, but

(echoing the first reason) reflect an ongoing socio-cultural dimension in the villagers' economic practices (see Subsection 7.3).

Accordingly, my discussion within the two viewpoints overlaps with the overall theme of my thesis. First, sub-section 7.1 briefly discusses the villagers' situation regarding land availability and its socio-economic dimension and what it was like before and since the Civil War, followed by a consideration of village labour and wealth and status. This is followed by subsection 7.2 which discusses the social dimension of the villagers' cocoa production process where they contribute wet cocoa beans to family members, relatives and friends and/or work with one another in producing dried cocoa bean outputs for sale for meeting each other's cash needs, and how changes in cocoa yield influence the economic behaviour within the households in the context of their local structures (pp.125-130). This phenomenon is reinforced by the unpredictable weather conditions and cocoa market circumstances which affect the financial conditions of smallholder cocoa farmers worldwide (Chapter 3, pp.34, 36; Chapter 5, p.81). Subsection 7.3 attempts to briefly integrate my discussion.

7.1 Land Availability and Cocoa Production in Iamaru Village

Currently, land availability in Iamaru village is not a problem (as noted in Chapter 5, p.101), although the tenure system is coming under pressure. In Buin, in terms of cash cropping, the overall population density is relatively low (approximately 1.85 persons/km², using a 1982 figure from Lummani 2005: 240, Table 1)², although some Iamaru villagers perceive land constraints mainly due to the subdivision of cocoa blocks in the inheritance process associated with increased lineage size. In part, this is associated with increased teenage marriages, concomitant with social changes emerging during or since the Civil War, when many people who grew up during the war married very young, in the range of 15-21 years, and now have children. This process contributed to the increased number of households in Iamaru village. An associated factor is the lack of effective family planning services regarding the spacing of children (especially among young couples). Village households are therefore larger than in the past, an outcome of which seems to be increased cocoa plantings on clan land.

Fifteen households in the sample said that they would be faced with land constraints for expanding cocoa blocks in the very near future. These households are listed in Table 7.1.

Table 7.1: Cocoa Area Per Adult Equivalent of the 15 Households Who Perceive Land Constraint in the Near Future

Household #	Household Size	Adult Equivalent	Area (Ha) Per Adult Equivalent	No. of Cocoa trees (1 ha = 625 trees)
29	9	7.5	0.47	2,200
13	9	8.5	0.36	1,900
11	6	5.5	0.53	1,812
8	4	2.5	0.98	1,535
18	8	6.5	0.38	1,528
7	6	3.5	0.48	1,050
21	5	3.5	0.47	1,022
15	9	7	0.21	910
23	6	4	0.36	900
33	6	4	0.36	900
4	8	5.5	0.23	800
14	10	9	0.12	700
16	8	3.5	0.27	600
25	10	10	0.09	550
12	6	3.5	0.13	290
Mean	7.33	5.60	0.36	1,113
(s.d)	1.88	2.36	0.22	

Some households (#7, 8, 12 and 21) were relatively newly married couples, marrying immediately after the Civil War. Three of them have over 1,000 cocoa trees and household #12 was still planting at the time of fieldwork. Household # 25, although with a mean adult equivalent household size of 10, has adult children. Because the householder allocated portions of his pre-civil war block to his three adult male offspring, he himself takes care of only 550 trees, while householder #14 was still rehabilitating his pre-civil war block at the time of the fieldwork and had planted only up to the figure shown on Table 7.1.

By comparison, households which did not mention that they will face any immediate land shortages in the near future are listed on Table 7.2. These, based on my interactions with them during fieldwork, seem to have been ones whose clans have sufficient land available which they can access.

Table 7.2: Cocoa Area Per Adult Equivalent of the 21 Households Who Do Not Perceive Land Constraint in the Near Future

Household #	Household Size	Adult Equivalent	Area (Ha) Per Adult Equivalent	No. of Cocoa trees (1 ha = 625 trees)
1	7	6.5	0.15	625
2	7	8.5	0.75	3,972
3	4	3	0.45	850
5	4	3	0.24	450
6	6	4.5	0.25	700
9	6	5.5	0.61	2,100
10	6	5.5	0.42	1,436
17	5	5	0.19	600
19	1	1	1.12	700
20	7	6.5	0.62	2,500
22	2	2	0.24	300
24	1	1	0.64	400
26	7	6.5	0.07	300
27	3	3.5	0.33	719
28	7	7.5	0.21	1,000
30	5	5.5	2.26	7,760
31	8	7	0.94	4,125
32	2	2	1.12	1,400
34	4	3	0.69	1,300
35	4	3.5	0.60	1,500
36	10	10	0.16	1,600
Mean	5	5.2	0.6	1,635
(s.d)	2.4	2.3	0.5	

Cocoa was the main agricultural income source. Over a quarter (27%) of the 50,437 trees for the 36 households were immature and not fully bearing, while a further 12%

were very young, non-bearing trees. Of the 61% of fully mature trees, actual yield was lower than potential yields due to pests and disease attacks, particularly blackpod, and longicorn (*longicornis*), and because of unusually wet conditions in 2003-2004.

Village Labour

The village economy is generally a land and labour-surplus economy (Chapter 5, pp.76-7), although individual households occasionally face labour constraints in terms of cocoa block management and production activities because of the diverse livelihood strategies in which village households are engaged (as noted in Chapter 2: pp.22-3, 26; also Chapter 6). This land surplus situation engenders a relatively stronger bargaining position of labour (surplus land means each villager could plant his own cocoa rather than work for someone else). This is why employment of labour on cocoa farms by villagers, although done occasionally, can be quite expensive by PNG village standards – often more or less around the minimum wage rate of K7.40 per day that is normal in PNG (BPNG, Quarterly Economic Bulletin, December Issue, 2006). For example, during fieldwork one farmer (#25) paid K6 per day to individuals employed for slashing cocoa blocks. In the long term it could be expected that factors such as population pressure, lack of alternative income earning opportunities, lower cash crop prices, government taxes and erosion of traditional social structures and increased social obligations could put downward pressure on wages. In addition, apart from the cost of seedlings, capital demands are low for cocoa block establishment on new land. Land is obtained at no cost in the village and fixed capital is minimal since a few farm tools (e.g., bush knife, sariff, spade, axe, cocoa hook) already employed for other agricultural activities are readily available for clearing, planting, weeding, pruning and harvesting. Herbicides are rarely used and, if spraying is undertaken, knapsack sprayers are borrowed from relatives and friends. The use of working capital is minimised through the use of family labour to clear, harvest and plant blocks. Hired labour is used only occasionally for harvesting and processing beans. Rather than requiring money, smallholders themselves transform forest and labour into capital in the form of cocoa trees. However, as noted earlier (Chapter 1, pp.4-5; Chapter 3, p.47-8), almost no money from cocoa is reinvested back into the farms.

Wealth and Status in Iamaru Village

Money, including tree crops that generate cash income, is, as LiPuma (1999: 192-213) argues, a means of influence and power, and a source of wealth and status (Chapter 5, pp. 78-9, 85-9). Likewise, in the early phase of cocoa planting (1950s-1960s), some of the sons of traditional men of influence (chiefs) in the village shifted their strategies from traditional means of gaining prestige to modern ones based on the acquisition of money, but this trend has been greatly undermined by the 'individualisation' of communal land tracts which allowed access to wealth by individuals (Chapter 5, pp.78-9, 85-9). This downplayed the importance of inheritance for status in a feudalistic kind of society where bondsmen and commoners dispose of wealth, especially pigs (and also the first harvest of certain food crops, such as specific types of bananas) to the chiefs who provided socio-political and economic security (Chapter 5, pp.85-9). Now, because of the erosion of these traditions (e.g., in terms of traditional avenues to achieve wealth, social prestige and power), any individual can plant cocoa to earn cash income - the contemporary road to prestige and status. Nevertheless, an improved social, financial and economic situation which is more open to the ordinary villager could be expected to intensify some villagers' pursuit of symbols of prestige in terms of modern material goods (Chapter 5, p.98).

7.2 Cocoa Yield Variations and the Social Circumstances of Villagers

Not all villagers reported their cocoa trees as bearing well and yields from family blocks are highly variable (Figure 7.1). This may be due to different physical block conditions (e.g., soils, drainage), pest and disease outbreaks, and different phases of rehabilitation activities. The majority of villagers sell wet beans weekly in units of 15-25 kg, mostly in 25 kg rice bags. Households selling relatively larger amounts, for example, above 25 kg use 40-50 kg plastic fibre bags.

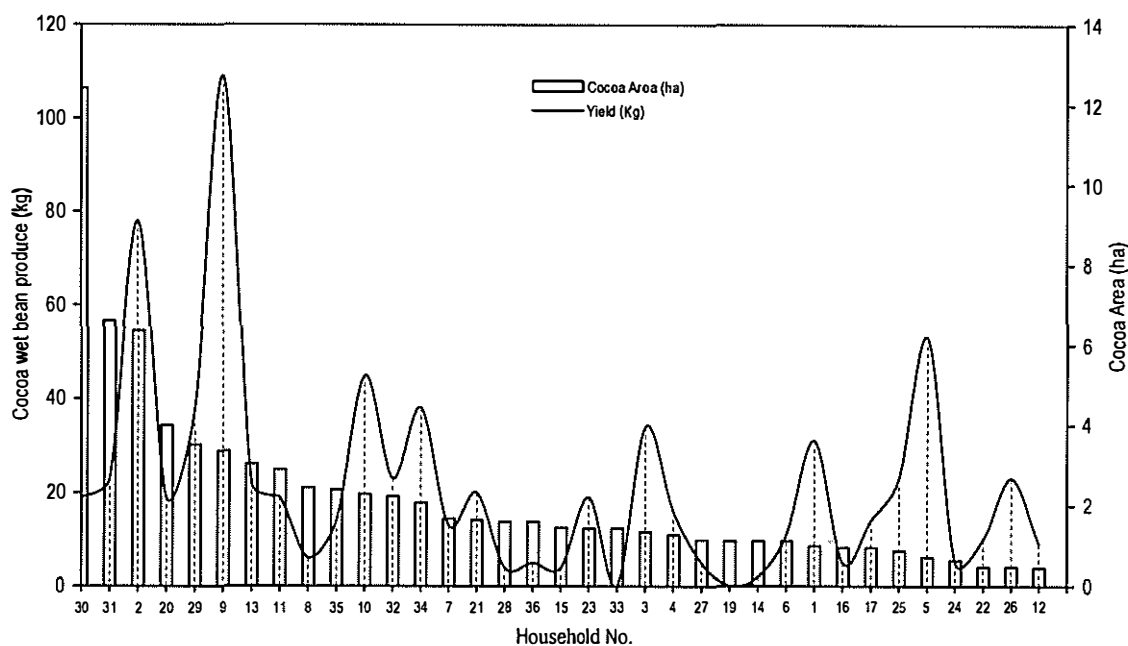


Figure 7.1: Mean Weekly Wet Bean Production (Kg) Per Family (Note: the yield figures in Figure 7.1 are based on wet bean produce from the households' family blocks in 2004. These data were initially collected by recall method from the farmers involved in the research fieldwork. The data were then checked against wet bean sales records kept by the only village wet bean dealer who bought most of the wet beans sold by Iamaru villagers during 2004. Ninety one per cent of the farmers sold their wet beans to this dealer, some of whom were his relatives and friends. This made it possible to cross-check some of the data gathered by the recall method to ensure the reliability of the data provided by farmers who could not recall properly the amount of wet beans they sold, particularly during early 2004. Some farmers who sold wet beans only a couple of times, say, 1-2 times, towards the end of 2004 (i.e., November – December), managed to properly recall the amount sold. Nevertheless, for farmers who found it difficult to recall the quantity they sold, especially sales prior to 2004, they were asked about the type of bags used from which their sales were calculated.

Average household production in the village was relatively low at 200 kg or less per household/ha/year. Although not all trees were bearing at the time of fieldwork, the effects of longicorn beetle (*longicornis*), black pod disease (due to high rainfall) and grazing parrots, greatly reduced yields, so that even households with fully bearing trees were not achieving above 200 kg per household/ha/year (98 kg/ha/year).

Following the Civil War almost all households did not produce sufficient wet beans for dry bean processing, especially during non-flush periods. For processing purposes, they combined their wet bean production with that of relatives. Figure 7.2 shows the quantities of dry beans produced by villagers (which included beans obtained from relatives during 2004).

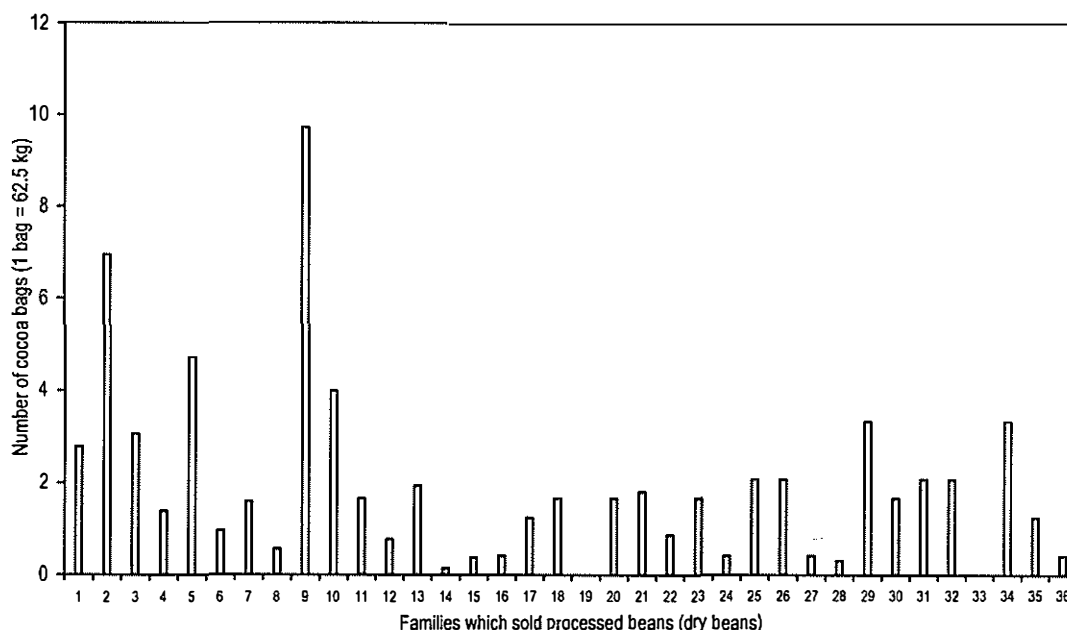


Figure 7.2: Family Dry Bean Sales in 2004 (figures include contributions from relatives) (Note: because their weekly production levels were very low, many families processed wet beans with contributions from relatives and friends. Households were asked about the number of times they sold dried beans during 2004. Since most farmers made only occasional sales with most of them selling dried beans 1-3 times (notably 1-3 bags per time period), they were able to recollect the number of bags of dried beans that they sold during 2004, at least with some degree of certainty. In some instances, other family members assisted the head of the household in ascertaining the number of bags sold. Thus, the data are as reliable as they can be.

Of the total number of households producing dry beans, 61% produced less than two bags (125 kg dry bean equivalent). During fieldwork some households ‘repaid’ ‘loans’ of wet bean received from friends and relatives prior to the fieldwork while others held ‘debts’ to be repaid at some future point in time when their cocoa trees bear well or when donors call in their loans. Recipients of wet beans could also delay reciprocating their wet bean ‘loans’, perhaps, in order to attend to some immediate pressing cash needs and obligations such as school fees. Thus, there is a lot of shifting of wet beans between friends and relatives.

Twenty four of the sample households reported that, in 2004, they sold processed cocoa beans over the course of the year from their family blocks. Their annual average cocoa income was K2,080/household.

By working in cooperative groups helping each household’s family in turn, families typically produce one to three bags of dried cocoa beans per harvest round per year.³ However, five to ten bags of dried cocoa beans could also be achieved if

families have sufficient cash savings or access to cash from friends/relatives to buy extra wet beans, as the following example illustrates:

...my intention to buy wet beans will depend on funds...if I do not have enough money by the time the cocoa season arrives, I may borrow from my brother or some of my friends and relatives I normally deal with in this regard...I usually repay borrowed funds when I sell processed beans but I could also take a little longer if I have a specific agreement with the lender or if circumstances allow so long as I inform the person concerned (#32, 15/3/06).

Village farmers do not normally pay interest on loans of funds. To villagers, the time value of money does not seem a primary concern. They are more concerned with helping one another in order to meet cash needs or to raise money for some specific purpose. One farmer (#7) confided to me that requesting and demanding interest on money lent to close relatives/friends could lead to his loss of status in the community. For such behaviour, villagers could be stigmatised as being “greedi” (greedy), that is, being seen as a miser who values money more than family and community relationships. The label ‘greedi’ is very derogatory with connotations of a person whose actions and behaviour undermine social relations in the community and give rise to jealousies and bad feeling.

Just as in lending cash to one another to buy wet beans, village wet bean processors sometimes let relatives and family friends use their buyer’s license⁴ to purchase additional beans to make up sufficient quantities for processing. Farmer #9 made close to ten bags of dried beans (Figure 7.2) in 2004, relatively higher than other villagers, because of gifts⁵ of extra wet beans received from his relatives for his deceased mother’s funeral expenses in that year. Relatives boosted his output to about 1,750 kg of wet beans, equivalent to 9.72 bags of dry bean. He processed the cocoa beans on the Situai Family Group (SFG) fermentary and sold the dried beans under the fermentary’s registered name although he was not a financial member of the group (Vignette 7.1). The members decided to help him meet his obligations.

Vignette 7.1 Wet Cocoa Bean Contributions for Meeting Funeral Expenses

Liuma has four children, all of them in school at the time of fieldwork. His family block of 2,100 cocoa trees (3.36 ha), was not bearing well due to pest and disease attacks and excessive rainfall. In the period preceding fieldwork, Liuma asked his first cousins and in-laws for wet bean contributions in order to meet his mother's funeral expenses. Helping relatives to fulfill funeral obligations including labour used in digging a hole to bury the dead person, or rendering other assistance, is important for maintaining relationships and social identity. His only sister helped his household in harvesting activities on the family block. They supplied him with three-and-a-half 50 kg bags of wet beans. These, he supplemented by buying extra beans at K1.40/kg when the market cocoa price was around K300/bag (K0.30/kg) and made a total of 16 bags of dried beans. Liuma pointed out that he would reciprocate their assistance when one of them is in need.

Date of interview: 26/01/05

Farmers #19 and #33, had no processed bean sales because both farmers had recently planted cocoa trees that were beginning to produce the first mature pods at the time of fieldwork. Farmer #19 is a young bachelor and a marginal farmer, who had not sold any processed beans since 1996. He had no money with which he could buy extra beans and his father's cocoa trees were also bearing poorly. Moreover, he had no extensive friendship networks. On the other hand, farmer #33 (a well-educated male household head), sold six bags of dry beans in 2003 by processing wet beans he purchased from his village relatives. They willingly sold him beans despite the buying price being lower than the market price to help him re-establish in the village after returning from a long absence in Lae, Morobe Province. Their willingness to supply him wet beans was a sign of solidarity and of his group identity as a member of the family and village community: a sign that he was welcomed back into the broader group as full member with the rights of membership such as land tenure rights. Hence, price was not a determining factor for their willingness in supplying wet beans to him.

In the village, families begin thinking about processing beans if their wet bean harvests reach two to three bags (50 kg per bag) of wet bean per harvest round. Households will draw on their social and kinship networks for extra beans to make up a bag or two of dry bean. Such exchanges are later reciprocated when relatives call in their loans of wet beans when they need them to make up some bags of dry

beans. These sorts of exchanges, as Connell (1997: 87-92) notes, are facilitated by kinship and social obligations rather than commercial dictates (Vignette 7.2).

Vignette 7.2 Raising Money from Cocoa for a Brideprice

Kamos is the last offspring in a family of four siblings. He was married in 1994 but could not pay his brideprice at the time, in part, due to the circumstances of the Civil War. His family is not well off in terms of financial resources and other material possessions. During 2003-04, he began planting a cocoa block and at the time of fieldwork he had planted 290 cocoa trees which were not fully mature. To meet brideprice payments, he purchased cocoa wet beans from his brothers, first to fourth degree cousins, niece, sister and uncle. Kamos purchased cocoa from them at K1/kg, a price well below the market price of K1.20/kg offered by other buyers in the surrounding area. Together, with the help of his first cousin, he processed and sold 9.5 bags of dried cocoa beans in the 12 months preceding fieldwork in order to pay the brideprice of K1,500. During an interview, Kamos told me that he will reciprocate their assistance when one or more of them requires assistance. In addition to helping with brideprices, he may also contribute to helping them in terms of compensation or support them in conflicts in the village such as disputes over land tenure.

Date of interview: 28/01/05

Gender and Cocoa Production

Typically, during low production periods male household heads semi-abandon cocoa production and rely on their wives and children to harvest the few available cocoa pods and allow them to keep the money for their own purposes:

...when cocoa trees do not bear well, I just let Bobos [his wife] and the kids harvest whatever pods are hanging on the trees for their own use, for example, for soap and so on...I might just ask them to give me K2 for credit repayment at tradestores for items such as torch batteries and the like...(#12, 28/01/05).

The sale of small amounts of wet beans is, thus, mostly undertaken by women and young children. Children use the money to purchase school stationery, while women use the income to meet immediate household needs like kerosene for lamps, or rice for the evening meal. Figure 7.3 shows the mean weekly wet bean sales and incomes for sample households over the fieldwork period (i.e., from the 28th December 2004 to the 26th March 2005).

All households sold their wet beans to the same wet bean dealer (#2) in the village. The fieldwork period in which these sales were recorded coincided with a period of low production in Buin (especially at the study site) but which began to pick up as fieldwork ended.

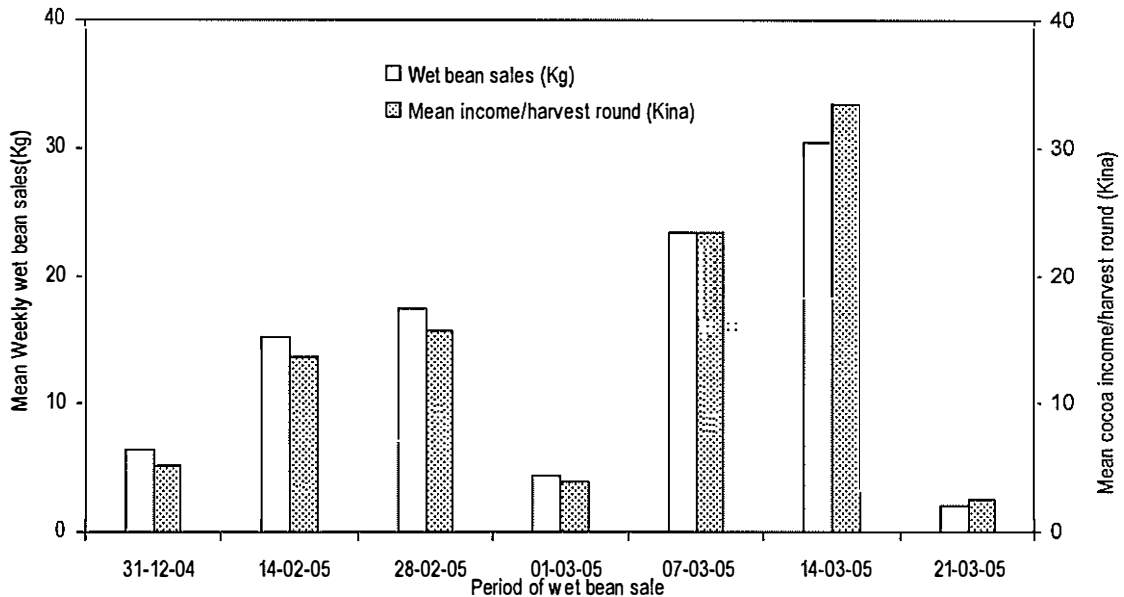


Figure 7.3: Mean Weekly Wet Bean Sales (Kg) and Incomes (Kina) Per Household During Fieldwork [28/12/04-26/03/05]

The mean incomes (Figure 7.3) in the fieldwork period were relatively low, ranging from K3 to K40/household/harvest round/fortnight, with a median of K18.35.

Gender Differences and Power Relations in Cocoa Sales

Figure 7.4 shows the quantities of wet bean sales by gender in the village over the fieldwork period. Individually and independently, female household heads rarely sold more than 40-50 kg of wet beans per sale, unless funds were required for specific purposes like school fees or meeting socio-cultural obligations such as contributing to a deceased relative's funeral expenses. The only female who sold more than 50 kg of wet bean was a young student, a member of farmer household #2. Her father told her to harvest the cocoa pods with her mother so that she could pay her school fees.

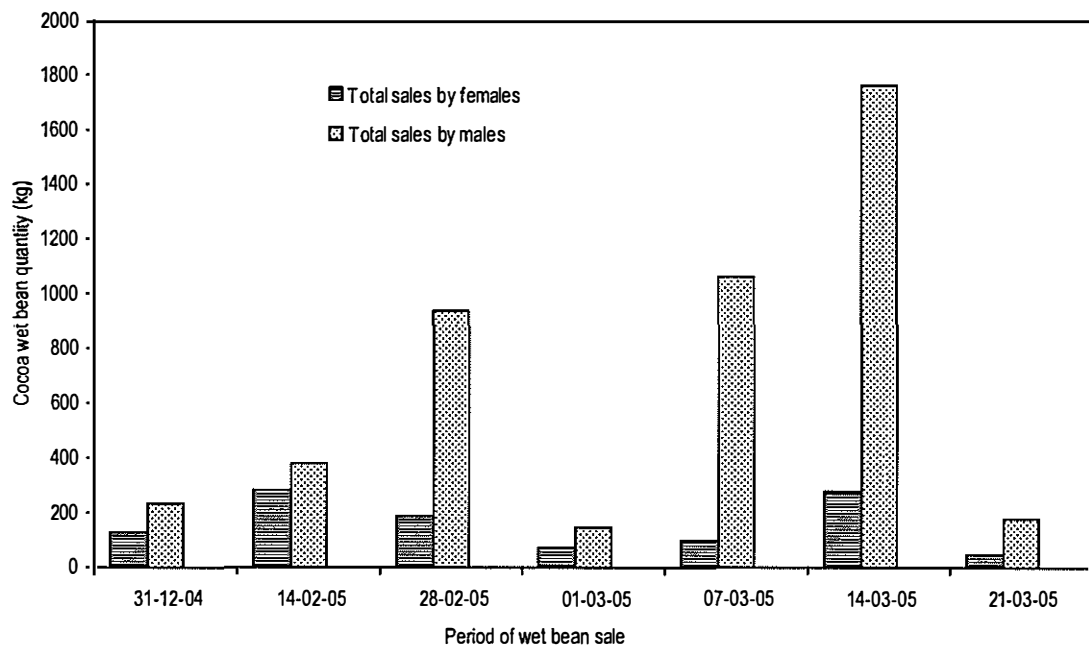


Figure 7.4: Wet Bean Sales by Sex During Fieldwork/Seller/Harvest Round [29/12/04-26/03/05]

During fieldwork, no female household head sold processed beans. In fact, it has never been the case within the sample households and not for any other villagers that I am aware of. Part of the reason for this relates to the local socio-cultural structures.

The first reason for women not being involved in dry bean production, transportation and marketing is because the tasks involved are quite laborious and time consuming, and thus are deemed to be unsuitable for females (e.g., turning cocoa beans on the drier bed, cutting and transporting firewood, packing, loading and unloading cocoa bags from vehicles). Women's participation in these activities would be seen as interfering with their gender specific routine of household activities (Chapter 5, pp.85-9).

Secondly, culturally, female household heads have no separate ownership of major assets like cocoa holdings. But the sale of dried cocoa bean (or relatively larger amounts of wet beans as noted above) on behalf of a female household member, although it is not a norm, may well happen for some specific reason. It is the case that, in patriarchal Iamaru village, male household heads would tend to exercise a decisive influence over family resources. This, of course, is not perceived

negatively in cultural terms, and many male household heads pointed out that a wife *duly* recognises a husband's role. However, some men confided to me that, in some families, a wife may exercise greater control over the use of family resources. This may be with the consent of her husband but it could also be a result of a wife's influential personality as in some families I was informed about. But female household heads are usually good managers of household resources. Thus, in the former case, a husband may let his wife exercise greater control over household finances, for instance, if he feels that he might easily acquiesce to unnecessary requests for money from friends (e.g., for buying beer, gambling and entertainment).

de Haan and Zoomers (2005: 27-47) argue that the foundational concepts such as social relationships, institutions and organisational structures provided by livelihood studies for understanding households do not complete the picture due to lack of attention to power relations within households, particularly the gendered relations of production. Moreover, they note that the influence of power relations on behaviour within households is not only to do with task-oriented activities (de Haan and Zoomers 2005: 36-7; see also Ellis 2000). In this village, for instance, women rarely partake directly in the transportation and marketing of dried cocoa beans. It is the case that a male relative, who may be paid some money, will escort dried beans to the export depot for sale if the husband decides to stay in the village.

Indigenous Exchange for Labour and Changes in Cocoa Price

Depressed world cocoa market conditions tend to reinforce villagers' tendency to draw upon non-market factors (social relationships) to improve or sustain their financial capacity to meet household cash expenses and social obligations, and to invest in other business opportunities such as fermentaries and tradestores. These can be in such areas as cooperation in terms of transportation and, as already discussed, pooling and processing of wet beans among relatives and friends.

Most cocoa farm maintenance activities during fieldwork were carried out by youth and men and women's' groups. Occasionally, individual villagers might choose to work on other people's cocoa farms to earn income for some specific

purpose, but not for a prolonged period of time, given that every villager has cocoa trees of their own which require attention. If cocoa prices are high when a grower's trees are not producing well, he may sell his labour for cocoa work on another person's cocoa block, and this is often within the realm of gift exchange rather than being a pure market transaction in labour, as the next section reveals.

i) high prices and hired labour

Based on interviews and observations of selected cocoa farmers during fieldwork, village buyers and processors of wet beans pay a variable cost for processing labour depending on the price of cocoa. But the amount of money paid usually depends on the relationship between the cocoa buyer/processor and the labourer. For instance, one farmer I monitored during fieldwork, paid his brother-in-law K70 for processing his cocoa prior to the fieldwork, but at the time of fieldwork, paid him K50 when crop prices were relatively low. The market rate for processing would have been approximately K80. This variance was mostly because of their ongoing relationship of mutual assistance. As the interviewee said, he had flexibility in terms of the amount of payment. They are co-residents who help one another in other activities unrelated to cocoa production such as the building of houses, and/or fulfillment of social and cultural obligations such as school fees, funeral obligations, and/or the acquisition of household materials such as pots, plates, bush knives, sariffs, and music boxes. Thus the amount paid to his wife's brother was determined not only by the price of cocoa but also by the nature of the relationship between them (Box 7.1).

Box 7.1 Case Study for Farmer #2

Tomaki has seven children, aged 29, 23, 21, 19, 15, 12, and 5 years. They are all in school. Their assets included a vehicle, tradestore, generator and, 35 farming tools, 16 of which were in good working condition. Of the sample farmers, he has the largest cultivated area of cocoa and number of assets, and is thus relatively well off in the village context. Tomaki lives with his maternal uncle, two brothers-in-law and their households, and his unmarried sister. He provides them with considerable gifts and assistance with social and customary enterprises such as payment of school fees and medical services. Tomaki also actively participates in fulfilling community obligations: maintenance of the primary school (using his lawnmower), feeding of fellow worshippers in church gatherings, assisting needy individuals, and helping to fund funeral ceremonies.

Box 7.1 (continued)

While he has resources not available to many village farmers, he is also a hardworking man. He is an active cocoa grower, good manager and a religious man with a good community standing. During fieldwork, his commitment to his blocks, and community assistance, had been both varied and in some cases substantial. Occasionally his monetary aspirations appeared to conflict openly with customary defined appropriate Buin behaviour. Two such instances suffice as examples:

While the practice of giving wet beans to assist others, or selling beans at a discount to kin who wish to buy, is common among villagers, it is also beginning to operate amongst family members. Two cases which occurred in Iamaru during the survey will be reported here: one request regarding cocoa transportation by a fellow villager (#18) and the other involving Tomaki's in-law (#27). Tomaki himself transported the beans to the export depot for farmer #18 who sold his beans and repaid Tomaki in terms of fuel. In the second case, Tomaki decided to transport housing materials free of charge for his in-law (married to his first cousin and a pre-school teacher) with whom he is also well pleased, describing him to me as 'hardworking and productive' compared with other villagers. His perception of the relationship seemed to have influenced him and made the transportation completely free of charge since his in-law did not even buy fuel which is often the case.

In another instance, Tomaki somewhat strained his relationship (perhaps because he was more of a victim of his own personality) with his relatives. As the man in charge of the Situai Family Group (SFG) processing facility, he did a great deal of work maintaining it, sometimes at his own expense, both prior to the Civil War and afterwards, and, as manager, he had never allowed access to non-financial member relatives outside of the SFG. The group has no business arrangements with other people or relatives within the village; rather those helped by the group would reciprocate somehow if beans are processed using the facility. Following the Civil War, he allowed a relative to process beans providing his own labour, firewood and transportation of beans to the facility. This was for a non-economic purpose of meeting a bride price payment. But some financial members complained (at least secretly, perhaps not wanting to hurt the manager's feelings), of the manager's inappropriate behaviour because he did not charge the relative for the use of the fermentary although he paid K10/bag for Tomaki's vehicle. By such an extension of a 'gift' to a relative outside a 'core group' he compromised what he intends to achieve between customary values and commercial aspirations, and individual security founded on reciprocal exchange among kindred was impaired: doing business in a rural village is an art of maintaining a delicate balance between market requirements and the needs of the indigenous exchange economy.

Date of interview: 29/12/04

ii) low prices and reliance on indigenous labour exchange

Low cocoa prices do not necessarily lead to an intensifying reliance on indigenous labour exchange among villagers. People always rely more or less on the use of indigenous labour (depending on circumstances at a point in time) which has always had a strong non-market dimension in terms of helping other villagers perform activities which have cultural and social value in their lives. Nevertheless, a

fall in cocoa prices enhances cooperative actions among villagers wherein relatives and friends employ family labour on cocoa production activities such as harvesting, processing, and pooling of wet beans, either for collective processing and drying, or on a reciprocal basis.

Using Indigenous Labour in Harvesting and Maintenance Activities

The use of family labour (pp.122-4) is the norm for cocoa harvesting, except during flush periods when non-household labour (often extended family members, family friends or youth groups) may also be recruited to help with harvesting activities, and be paid at some fixed rates (e.g., K3/day) or in-kind. This also applies to maintenance activities (Box 7.2). But, among immediate family members, and because of the importance of family relations where family members liberally help each other, in-kind costs (i.e., in terms of buying food items for cooking for workers) may be deemed unnecessary:

...whenever I feel things look a little bit brighter with better cocoa prices, I would buy rice and tinned fish for members of our extended family [his two younger brothers and their wives and children] who may assist me [with cocoa harvesting], or else they could go and find their own food to eat...it does not really concern me [about the need to pay them or to cook food for them] regarding my family members...we are always together, helping each other (#32, 15/02/05).

Box 7.2 Case Study for Farmer #20

This case study is about Baruni, a fourth offspring in a family of two brothers and seven sisters. Baruni is married and has five children aged 26, 22, 19, 13 and 5 years. The eldest children contribute labour in cocoa farming activities.

Baruni had 2,000 cocoa trees at the time of fieldwork. Two of his sisters who have children out of wedlock reside with him and assist him in cocoa harvesting activities such as hooking, heaping and breaking cocoa pods, and transporting wet beans to the fermentary for processing if the amount harvested is sufficient for processing. Two of his nephews (his sister's sons) also reside with him and help out in cocoa maintenance activities such as slashing of weeds and replacing deceased cocoa trees.

Box 7.2 (continued)

Baruni pointed out that working together with resident extended family members makes cocoa work easier for him because his wife does only light work due to prolonged illness caused by tuberculosis (*Mycobacterium tuberculosis*), and this situation also promotes family solidarity and a spirit of cooperation:

Quite often my nephews helps me do block maintenance. Normally, I do not pay them any cash money but tell them to process copra for sale, sort of recompense exercise", says Baruni, eyeing their abode. "Sometimes when we work when harvest is good, I may buy some items that young people prefer to have, like a small music box or a pair of shoes. And sometimes when harvest is not good, I do not have to give or buy them anything. But I always make them feel happy residing with us in the way I treat them. They do not cause any trouble for us like other young men around here. When they get sick we take care of them... we remain very close.

Baruni employs outside labour when the amount of work on his cocoa block requires it, and he normally employs his friends (relatives), whom he usually pays mutually agreed rates according to the circumstances at a point in time. In turn, he allows his friends whom he involves in cooperative activities (especially to do with cocoa block maintenance and processing), to process cocoa beans using his processing facility and transporting their processed cocoa beans to the export depot in Buin town. During fieldwork, for example, he employed 2 individuals for 3 days, who slashed part of his block for which he paid a total of K60 to be shared between them.

Date of interview: 03/03/05

During fieldwork, in-kind costs were often incurred when individuals and youth groups were hired to do cocoa block maintenance work or to help with house construction, such as preparing sago palm leaves for roofing, cutting bamboo for walls and transporting timbers. Table 7.2 lists the typical range of in-kind expenditures in the village for a working group. These almost always consist of rice, tinned fish, and noodles, but with the recipe occasionally involving garden food with protein acquired from rivers (fish, eels, prawns), forests (possum and wild pig meat), or local markets.

Table 7.2: Typical In-Kind Costs Incurred by Villagers for Cocoa Production

Activities	Items	Cost (PNG Kina)	Total Cost (PNG Kina)
-Clearing/slashing cocoa blocks	2 x 1000g packet of rice	K3 ea	K6
	-Harvesting cocoa pods	2 x 520g packet of noodles	K1 ea
-Transporting wet beans by shoulder	1 x 415g tinned fish	K4.50 ea	K4.50
	Total Cost (PNG Kina)	-	K12.50

Youth groups/individuals would carry out particular activities for one to two days, occasionally longer, but rarely more than a week. Prior to fieldwork, one farmer (#20) had his 5 ha cocoa farm slashed for five days by three friends (brothers) whom he paid K150 (K10/person/day). Also, whenever they (i.e., the brothers) want to buy and dry cocoa wet beans, he allows them to use his fermentary and drier.

The Cultural Context of Incurring Excess In-Kind Costs

Because, it is embarrassing to the host/“employer” and is also culturally inappropriate to underfeed workers, a household usually cooks more than enough food to ensure that all group members are well fed. If the workers feel satisfied and happy with the quantity and quality of food they have eaten, they feel that a good relationship has developed with their host and will respect him and feel more inclined to maintain the relationship in the future, perhaps through further work. If workers are not fed properly by not having enough food, they will feel that their efforts are not appreciated and in the future they could be reluctant to contribute labour on a cocoa farm for somebody who takes helpers for granted. As pointed out earlier, villagers do note the importance of showing appreciation for help rendered and for maintaining group solidarity and future support.

With in-kind payments of food, there is always freedom and flexibility in a sense that no one feels pressured to pay cash. It is only when a youth group or some individuals, for instance, are seeking work to earn cash for a specific purpose that a farmer and his household will pay cash. Sometimes youth groups look for work when some cash need arises, such as procurement of a soccer ball, uniforms, volley ball, or occasionally, to raise funds to pay for transport to games.

7.3 Village Socio-Economic Practices: Motives for Economic Action; Buying Wet Cocoa Beans

Village wet bean buyers are motivated by a range of factors, often related to what is going on in their lives at the time. As pointed out by Waddell and Krinks (1968: 69), in rural societies where non-specialised labour and subsistence production predominates, it is usually the case that a complex mix of motives, underpins smallholder production of cash crops:

...the feeling of emulation, the desire for public approval, the sense of duty towards the community, and the wish to conform to custom and tradition...find outcome in economic action.

Farmer #2 was a relatively well-off villager, who, following the Civil War felt the need to help fellow villagers, especially poor farmers, as he pointed out:

...sometimes I would buy wet beans even though cocoa prices are relatively low just to help other villagers who need money..., especially in bad times, just as when people were first resettling in their villages...people feel happy (30-12-04).

Therein, besides his concerns about profit, his awareness of his role as a member of the village community makes him take account of the social and economic security of the village community in the face of risks and uncertainties created by the Civil War, rather than only risks and uncertainties associated with market circumstances, notably commodity price fluctuations. This, of course, accords with the circumstances of village farmers who have non-market interests.

Also, related to the above point, one of Barret's (2005) conclusions relevant to this thesis is: "productivity will increase as identities become based more on innovativeness and material performance or as preferences adapt to place more emphasis on physical satisfaction and less on nonmaterial sources of wellbeing." Perhaps, this process will take hold strongly in the context of the rural cocoa farmers in PNG, as farmers intensify their pursuit of status and prestige (pp.120, 125; Chapter 5, pp. 100-01). One indication of this process relates to school fees, which are a major driving force for earning income from cocoa because people have growing expectations that their children will have more opportunities beyond agriculture (Chapter 6, pp.114).

As well as long-term investment expenditures like education, villagers cooperate in order to acquire material goods such as motor vehicles:

...I have been processing cocoa beans to buy a secondhand vehicle with the help of Sylvester...I have been purchasing beans belonging to my brothers only at K1/kg...for the second time, I purchased beans at K0.80/kg when prices were not as good...I should be buying again this time but production has gone too low...we help each other...we gave some cocoa beans to one of our friends when he required our assistance for his daughters' medical expenses...(#23, 07/02/05)

Certainly, cocoa households do have non-economic motivations for undertaking production activities judged to be valuable or good from their particular perspectives (for arguments associated with 'value-in-use' see Sagoff 2004; Wood 2004: 34-60; Kamenka 1981: 436-61). This is not counter-productive to efforts towards increased production. Rather, it calls for accommodation of these factors in the thinking of economists, because the cocoa smallholders' decision to produce is also a decision to act on the basis of non-market values. It is true that cocoa production is undertaken in response to market incentives, but, because farmers' behaviours and decisions are mediated by socio-cultural processes and values, they will sometimes forego optimal material gains even though they could still be increasing total production as the following example illustrates.

During fieldwork, prices paid to growers for wet beans ranged from K0.80/kg to K0.90/kg around the village.⁶ Growers do not automatically sell wet beans to the buyer offering the highest price in the village. Social factors are important in their decision on to whom to sell their wet beans, such as commitments to help relatives and friends and to promote group solidarity. In this, I have observed three villagers (#7, 8 and 29), reciprocating assistance to a buyer (#2) by supplying him with wet beans although he was buying at K0.80/kg, compared to another dealer buying at K0.90/kg in a nearby village. This is similar to the situation described earlier (Vignette 7.1, p.135). I asked one of them about it later, and he reasoned:

...the future is uncertain and we do not want to risk our chances of being assisted [i.e., in terms of transport services, especially cocoa transportation] again in near future... after all, he has always assisted us, and who knows, in the future he might be able to acquire a bigger truck than the current one, which he

would be able to help us facilitate transportation of our crops better than at present (21-01-05).

Their concerns over long-term social and economic security tended to influence the price they were willing to accept for their beans. They were not required to sell their wet beans to farmer #2 who was buying at a lower price, but they felt it important to show their appreciation and gratitude in view of their ongoing relationship with him.

Secondly, it also points to the fact that economic transactions involving kinship ties have an 'enduring dimension' to them rather than being temporally discrete and impersonal market transactions.

It is noted that the goal of national economic policy is to create a competitive market for economic efficiency so as to facilitate increases in productivity per hectare. However, it would be better if efforts directed at enhancing cocoa production in PNG also took into account the social and familial situations of farmers. In Box 7.3, based on my fieldwork data, I note some reasons for buying cocoa in the village. They are ordered according to their importance for the villagers under the three broad categories as shown but they do not necessarily reflect individual family priorities nor is their list exhaustive. Nevertheless, they reflect the aspirations and needs of the rural cocoa farmers. If productivity could be increased, then this would allow people to do more things in the rural economy.

Box 7.3

Some Reasons for Selling Cocoa in the Village

I) Maintenance of Family Welfare

1. To generate family income (i.e., building up of family income base, e.g., savings (during fieldwork money was mainly kept at the house for meeting immediate cash needs);
2. To meet annual education costs of children;
3. To meet the cost of medical services occasionally;
4. To buy family clothing and kitchenware occasionally;
5. To buy tradestore goods (processed food and protein) occasionally;
6. To generate income so that they might buy materials for building a permanent house for the family/a water tank; and
7. To have money available for occasional spending, for example, during cultural festivals, religious congregations, school bazaars and for spending on assorted items that the family may want to buy when there is spare money.

Box 7.3 (continued)

II) Precautionary Measures for Family and in relation to Relatives and Kin

1. To ensure that money is available to cater for life-crisis situations, such as deaths during the Civil War;
2. To ensure that money is available for fulfilling cultural obligations and also to help relatives and friends in this regard, for example, in terms of brideprice payments, funeral and ritualistic ceremonies to do with traditional doctoring of illnesses;
3. To ensure that money is available to buy trade store food (e.g., rice and tinned fish) for family during bad weather which affects garden food crops; and
4. To ensure that money is available to help in situations where family members, or relatives/friends need some financial assistance to fulfill their social obligations such as their childrens' school fees, medical care, or mending of ruptured relationships between kin/relatives/clans where food and other expenditures may be needed in the process of settling, especially serious disputes, such as the Civil War related deaths.

III) Maintenance and Build Up of Household Physical/Farm Asset Base

1. For buying new farming tools and equipment or to replace worn-out ones;
2. To buy materials (e.g., cement, nails, corrugated roofing iron, pipe) for a new cocoa fermentary and/or for maintaining existing ones; and
3. To have money available for helping to maintain a cocoa block if there is a need to employ outside labour for clearing a new land area for planting new cocoa trees, slashing weeds in existing cocoa blocks, harvesting, transportation of wet beans and processing.

Three non-study participant villagers told me that, if they had enough spare money, they would probably buy a generator, a chain saw and carpentry tools (hammer and saw)/fishing net respectively while one relatively well-off villager pointed out that, if he had enough spare money he would probably think about buying a secondhand vehicle to use it for his family purposes while at the same making some income from it from the various transportation activities.

Also, as stated at the beginning of this chapter, the reasons noted in Box 7.3, in general, testify to the theme of my thesis regarding the social in the economic practices of rural cocoa farmers in PNG where the product of their labour (outputs of cocoa) also promotes their social relationships (Chapter 2, 19).

7.4 Summary

To summarise, this chapter's discussion on Iamaru cocoa households illustrates that cocoa work activities (i.e., upkeep activities, harvesting, processing, transport and marketing), are more than mere cash income generation activities. Rural cocoa farmers do not separate their economic practices in terms of cocoa

production from the overall context of their socio-cultural lives. Their assistance to one another in terms of exchange of, say, cocoa beans, labour, or in fulfilling some specific aims, are not actions involving unknown individuals who acquire what each person wants through an 'impersonal' monetary transaction. Many villagers seek assistance while pursuing their individual ends in cocoa production, and this helps to engender new relationships with people and nurtures existing ones to strengthen and nourish them in an ongoing way. I also briefly discussed gender and production because gender divisions are one of the persistent features of this society and are likely to be so for a long time to come. While this is not an obstacle to increasing productivity, the promotion of gender equity in terms of access to economic resources like cocoa would probably increase productivity and improve the socio-economic welfare of rural families in the longer term. The cultural influences do not end at the PNG equivalent of the 'farm gate' but extend to the cocoa transportation system. This issue is taken up in the next chapter where I discuss the socio-cultural influences on transport and marketing, followed by a consideration of the capital base in Iamaru village.

CHAPTER 8 THE SOCIO-CULTURAL INFLUENCES ON TRANSPORT, PROCESSING AND MARKETING OF COCOA IN IAMARU VILLAGE

8.0 Introduction

Like other farmers involved in primary agricultural production activities in developing countries (Ellis 1999; 2000), it is not only cocoa production activities in Iamaru village but also several related activities that are mediated through social relations. For example, the use of capital assets such as chainsaws, farming tools, and vehicles are always organised in this way. Figure 8.1 depicts the factors that influence smallholder costs of cocoa transport. These can be grouped into the following categories:

- Effect of cocoa price fluctuations on transport costs
- The effects of relative crop values on transport costs; and
- Quantities of cocoa to be transported; and
- Kinship factors.

The Chapter begins with a brief discussion of how transport costs are affected by vehicle condition, costs of spare parts and fuel, distance and road condition and discusses how these cost structures are modified by the other factors such as cocoa price fluctuations, relative crop prices, the quantity of cocoa to be transported and kinship factors. An investigation of transport costs provides a way to explore how these social factors influence smallholder production. The last part of the chapter briefly discusses the influence of social factors on villagers' capital base in terms of farming tools and financial resources.

FACTORS AFFECTING TRANSPORT COSTS

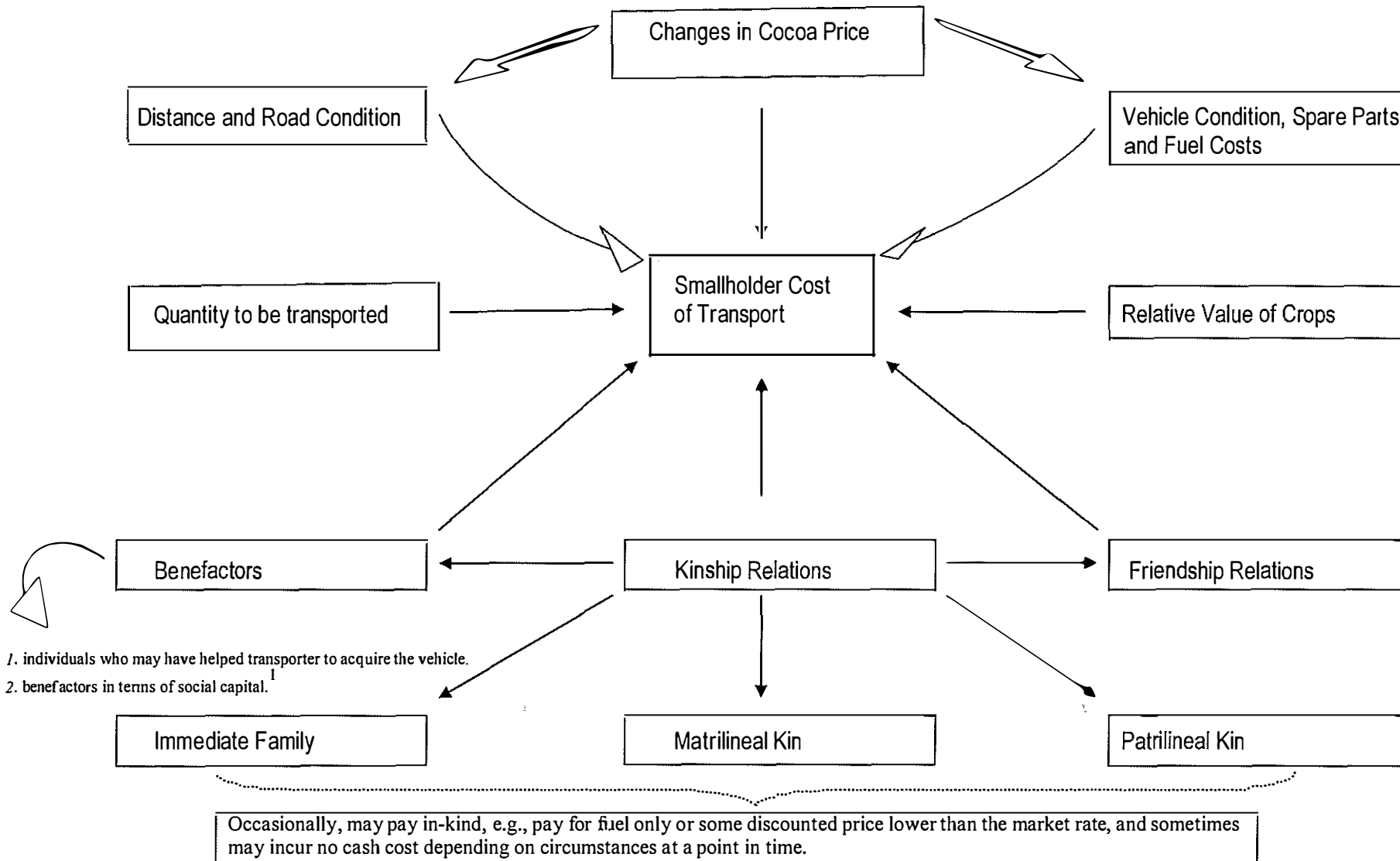


Figure 8.1: Schematic Representation of the Factors Influencing Smallholder Transport Cost

8.1 The effects of cocoa price fluctuation on transport cost

Like transport costs in other societies, distance and road condition significantly influence transport costs in Buin. Given the very poor road conditions and often relatively long distances cocoa must be transported, many producers lose a significant proportion of the value of their crop in transport costs. Farmers living around the Muisuru beachfront (Figure 5.3, Chapter 5, p.95), some 8 km from Iamaru village, were charged K16-K20/bag for transport of dried cocoa beans. This is an area where road conditions are very poor, with huge pot holes, and pools of muddy water, and some parts frequently cut off by rivers. However, while road conditions affect the price charged for transport, fluctuations in the price of cocoa also affect transport costs.

The effect of cocoa prices on transport changes is evident in how transporters adjust their charges to cover the costs of vehicle maintenance and repairs. Smallholder vehicles from the pre-civil war years were in very poor condition during fieldwork (Plate 8.1), and most vehicle owners could not afford the high cost of spare parts.



Plate 8.1: A Typical Smallholder Vehicle during Fieldwork

To help cover the cost of spare parts, vehicle owners charge more during times of high cocoa prices to build up funds for vehicle maintenance and replacement. For instance, in 2005 during fieldwork when cocoa prices were relatively high, smallholder costs of production per tonne were K302, 69% of which were transport costs. When cocoa prices are low, transporters reduce their charges to just enough to cover fuel costs but not sufficient to cover vehicle maintenance costs. If prices remain low then transporters can face severe financial problems if they have not accumulated adequate cash reserves to pay for spare parts and general vehicle maintenance. If low prices persist for a few months or more, most vehicle owners with mechanically unreliable vehicles will leave their vehicles unused. In early March 2005, transport costs were around 5% of the then cocoa price of K258/bag (i.e., K12.50) for the 15 km distance to Buin town (Chapter 5, p.95). However, when cocoa prices are high such as between mid-2001 and late 2002, when PNG cocoa farmers were earning K500/bag, the cost of smallholder cocoa transportation in Buin trebled to around K35/bag (7% of the crop price). Table 8.1 shows the mean cost for transport per bag when cocoa prices were in the range K300-K350 and when they were less than K250 per bag.²

Table 8.1: Price of Dried Cocoa Bean Transport (Kina) Per Bag for the 15 km distance to Buin town

	Transport Price Per Dried Bean Bag (PNG Kina) when price is K300-K350	When price is <K250
Mean	K13.20	K3.38
S.d	K3.19	K1.41

Thus, there is a tendency for transporters to share in the good times of higher prices, with their proportional share of the value of the cocoa increasing as cocoa price rise. The benefits of higher prices (or costs of reduced crop prices) are shared by everybody in the marketing supply chain, not just growers themselves and, disproportionately more so by transporters. Cocoa processing labour is also costed in a similar way as I observed during fieldwork (Chapter 7, p.134).

8.2 Effect of Relative Crop Values on Transport Costs

Village transporters charge different prices for the transport of cocoa and copra. Over the same distance and route they charge around K7/bag for dried copra, compared with the average of K13/bag for cocoa. However, transporters do not concentrate on the transportation of cocoa instead of copra. They cart both cocoa and copra when sufficient quantities are available for transportation. This serves their interest in terms of generating incomes given the limited opportunities to make money from transport activities. But, sometimes, despite the different rates, the copra to be transported may belong to some immediate family member, close relative, or personal friends who a transporter might feel obliged to help out (see below).

The phenomenon of paying a higher transport price for cocoa than copra is not limited to Bougainville, and has been observed in other areas of PNG (Lummani and Nailina 2001). Curry (2004, pers. comm.) also observed in the Gazelle Peninsula, East New Britain Province, that transporters charge different prices according to the relative value of the two crops. Cocoa is a high value crop and transporters charge more for cocoa than copra in the same way they charge more for cocoa when prices are high.

8.3 Quantity of cocoa to be transported in relation to farmer income

Typically, villagers transport one to three bags of dried cocoa beans on PMV vehicles (Chapter 7, pp.127-9), and may hire a vehicle if the quantity to be transported is over three bags. Based on my fieldwork observations, a transporter may feel compassion for poorer farmers in the village who may sell only half a bag or one bag of dried cocoa beans, and charge them less than the market rate per bag. Sometimes the transporter may tell the farmer to buy only fuel for the vehicle, or a 6 pack of beer to be shared during the return trip to the village. I also observed during my fieldwork that, a poor farmer who sells a small amount of cocoa beans (perhaps processed using his friend's fermentary), sometimes may feel that he has received a substantial amount of money from the sale of his cocoa and wishes to enjoy some of it with the transporter who transported his cocoa. Thus, occasionally, one sees farmers and transporters drinking beer together in town at the farmer's expense after

selling cocoa beans. Thus, occasionally, farmers lose some of their cocoa incomes to social life which leaves them with less money for re-investment in their cocoa blocks.

8.4 Different transport charges according to the purpose and vehicle used

Transport charges also vary depending on the purpose for which a vehicle is used (Box 8.1). Some examples of the purposes, including social purposes for which transport may be hired, are listed below, not necessarily in order of importance. Transport charges for different services are again modified by the influence of kinship as discussed in Section 8.5.

Some Occasional Transport Requirements

- | | | |
|---------------------|---------------------------|--|
| 1) Tradestore cargo | 6) Political gatherings | 11) Cultural festivals |
| 2) Medical purposes | 7) Student transportation | 12) Courtesy visits to distant relatives |
| 3) Sporting events | 8) Wedding ceremonies | 13) Occasional private business trips |
| 4) Church events | 9) Funeral ceremonies | |
| 5) Peace ceremonies | 10) School bazaars | |

The data, based on my field observations of the ten vehicle owners and, baseline interview, is summarised in Table 8.2. It should be pointed out that the discount limits are only indicative of the sort of price range within which a vehicle owner-operator might vary his charges. The amount charged per activity by each vehicle owner was relatively uniform because all vehicles (except two) were stationed within a radius of 1.5 kilometres of my house.

Table 8.2: Transport Activities and Costs (PNG Kina) for a 15 km Distance

Activity	Normal Market Rates (Kina)	Discount Range (Kina)
Cocoa and copra	K130/load and K70/load	K2-K3?
Market	K40/load	K1?
Hospital	K120 hire/load	K20-K40?
Firewood	K12/load	K2-K3?
Tradestore Cargo	K40/load	K1?
Business Trip	K100 hire/load*	Only within Buin district

Note: 1 load = 10 units. *the market rate for business trip increases as distance extends beyond the district.

Vehicle owners tend to charge more if the transport is for activities that will earn money such as cocoa/copra, cartage of firewood for drying cocoa beans, cargo for tradestore and business trips. Further, similar to charging more when cash crop prices are high, vehicle owners vary their charges to women depending on their levels of sales at local markets, that is, they vary the transport charge based on how much women earn from market sales. For example, if women do not sell much of their produce at Buin market, the PMV driver will charge them less; if they sell a lot, they pay more for transport. But again, as the next section shows, these charges can be further modified by social relationships and kinship ties.

Box 8.1

Case Study for Farmer #36

Sibeki is a widely known for his frequent beer drinking. Many villagers conceded that Joseph works only occasionally on his family cocoa block when he takes time off from driving his vehicle: he does not employ a driver. The vehicle is a gift from his brother to assist his family at home. For spare parts, Sibeki sends money to his brother in Port Moresby to buy the required spare parts even if he does not have enough money. His brother and his working wife make up the difference in the cost of spare parts.

Cocoa

Sibeki makes around 20 trips a month to town in cocoa flush periods, but unlike other vehicle owners, he strictly charges a market rate of K10/bag.

Hospital

The hire rate for transporting sick people to the district hospital in Buin town (15 km) is K60. Market rates for other vehicle owners range from K80-K120 for medical purposes and by comparison his rate is very low. He has a relatively new vehicle and, hence, mechanically reliable compared with transporters with mechanically very unreliable vehicles who normally would charge higher prices in taking into account the condition of their vehicles. Nevertheless, like other transporters, Sibeki charges higher market rates for income-generating activities to compensate for this.

Taking women to the market

Sibeki charges a market rate of K2/trip, and for women with baskets of food to sell, K4/trip. The average number of trips to market is four runs a month.

Tradestore cargo

He maintains a market rate of K2/item (e.g., carton of twisties) but still he might transport his personal friends' items at a discount if there is a large amount of cargo that needs to be transported.

Friends

I have also observed that Sibeki tends to incur some 'entertainment cost. I have witnessed a friend of his who took four trips a day with him whom he requested to fix his car stereo. Sibeki bought him a 6 pack of beer in addition to the repair cost of K150 which he paid him. In this way, he negotiated his friend's market rate, while at the same time ensuring his friend's willingness to assist him in the future if the stereo breaks down again.

8.5 The influence of social and kinship factors on transport costs

Kinship relationships exert a very strong influence on cocoa production through their influence on labour, transport and marketing. Depending on the type of relationship, a transporter might cart a farmer's produce at some discounted charge and/or get recompensed according to some specific arrangements. For instance, if a transporter carts cocoa bags belonging to a family member he will charge less than the market rate (Vignette 8.1).

Vignette 8.1 Helping Family Members

Siniku has an old secondhand Toyota which he bought for K3,000 with personal savings in early 2004. His brothers did not contribute money to the purchase of the car because they did not have any spare money at the time. Siniku, unlike his brothers, is a good manager of household resources and does not waste money unnecessarily. He is able to save most of the money he earns from his cocoa block. He does not know how to drive and relies on two of his older brothers to drive the Toyota. During fieldwork his eldest brother transported five bags of dried cocoa bean for one of their nephews (sister's son), who lives 2 km away with his father. The market rate was K15/bag but their nephew paid 66% less at K5/bag. During the monitoring survey, the nephew told me that this has always been the case: he gives large discounts to his nephews, brothers and sisters.

Date of interview: 03/02/05

Along the lines argued in Chapter 2 (pp.23-4), sharing resources/wealth in PNG is instrumental in terms of maintaining group identity and solidarity in the context of an individual's obligations, rights and claims in relation to other family members/kin. Failure to share wealth could lead to one being viewed as a miser, selfish, greedy and even arrogant as one attempts to accumulate wealth and build up one's status with no consideration for others in the family or community (Chapter 7, p.128).

Social and kinship relationships mediate costs of production in various ways that reflect different circumstances and situations at particular points in time. For instance, in the monitoring survey, I observed that individual transporters' charges could be influenced by a range of factors such as the personality of the transporter

including his personal qualities like compassion for needy farmers, and how much importance (or trust) he attached to personal relations with others (Vignette 8.2). Such social influences also supports the ad hoc nature of the cocoa price threshold points noted above, within which transporters might begin charging lower or higher prices for transport services.

Vignette 8.2 Offering Transport Price Discounts to Trusted Individuals

Nako and his wife have two sons. The parents are well educated by village standards. Nako worked for the PNG Electricity Commission until 2000 when he resigned and re-established himself in the village. He planted a 2 ha family cocoa block with 1,500 modified SG2 hybrid clones. He has a vehicle which he often uses to do work with the youth group that he leads. During the cocoa flush periods, Nako makes around 20 trips per month transporting villagers' cocoa. Nako charges a market rate of k10/bag but when cocoa prices fall, to around K100/bag, he charges K8/bag but he usually offers this to people that he knows very well and trusts.

Date of interview: 26/03/05

Also related to the above point is that, traditionally, younger brothers defer to their older brothers who generally support their younger brothers in their economic endeavours. But if the younger brother possesses some wealth he will provide financial (or other) support to his older brothers. For example, if a younger brother who has a vehicle refuses, without good reason, to lend his vehicle to his family members who want to use it for some specific purpose he will be seen as 'greedy' (selfish) (see Chapter 7, p.128). If such behaviour continues, it might affect social harmony amongst the concerned individuals and the family (Vignette 8.3).

Vignette 8.3 Wealth Sharing Dimension of Transport Services

Kugeu is the older brother of farmer #21. He and his family reside at the edge of the village with their seven children aged from four months to 15 years. Kugeu and his wife went as far as Grade 5 in their schooling. Their first child was in Grade 7 at the time of fieldwork.

Vignette 8.3 (continued)

During fieldwork Kugeu was in the process of constructing his new house. I met him standing the posts of his house in a newly cleared area away from the main village. Because he and his family were not earning any income from cocoa as production was very low, his youngest brother lent him his vehicle to use it to raise money to pay for labour in the preparation and transportation of roofing materials (sago palm leaves) and to carry wood from the forest to the feeder road. Initially, the youngest brother showed some reluctance to lend the vehicle because of its mechanical unreliability, but Kugeu complained that if he did not use it, he would no longer fix it if it broke down, because, as he told me, he is the one who usually fixes it whenever mechanical problems occur. One Saturday during fieldwork, Kugeu made two trips transporting people to the Buin town market. The fuel used for this purpose was given to him by a nephew. He did not have to pay his younger brother any money for the use of the car so long as he kept it running to generate the money he needed for his purposes.

Date of interview: 29/12/04

For the general public market rates of charges are often strictly enforced, sometimes at a level where it may seem a little less than profiteering as in one case I observed where a transporter charged K50 for 50 kg for a 2 km trip. In contrast to transport costs for strangers, vehicle owners involved in the study view it as being morally inappropriate to adhere strictly to market rates of costs when providing transport services for family members and close kin (Figure 8.1, p.145). Nevertheless, smallholder transporters do take into account the circumstances of service recipients as pointed out above where poor farmers with small quantities of cocoa may be charged lower than the market rate for transport. Based on my fieldwork interviews and monitoring survey, a transporter is less likely to grant a discount to a well-off member of his extended family. Most transporters see no need to consider lowering charges for a relatively wealthy member of their extended family such as a person with several income-generating assets. Someone who would fall into this category would be a person owning several cocoa blocks, a large village tradestore, several pigs, a poultry shed, generator, video set, chainsaw, permanent building, and a cocoa/copra processing facility. Such a person is much less likely to be given a discounted charge for transport.

In this sense, the reasons that warrant consideration of discounts from vehicle owners are mainly non-commercial, notably to do with expressing interpersonal/group solidarity in terms of mutual assistance in the context of village life. This also means that a relatively well-off person is expected to share his wealth with the financially and materially less well off in the village. Overall, the system of exchange, and obligation and its influence on market activities both work as a levelling mechanism whereby both gains and costs are shared amongst the community.

Village Investment in Businesses

Smallholder transporters who received financial assistance with buying vehicles have expressed some sense of being obliged to their benefactors. The repayment of loans does not impersonally disassociate a transporter from his financial benefactor. This is not an investment in a strict market sense but a situation where there is always room for some consideration of those who have rendered help in the past (Box 8.2).

Box 8.2 Case Study for Farmer #23

At the time of fieldwork, Jon had four children, aged 11, 8, 5 and 0.83 years. Jon and his wife are educated to Grade 6. After the Civil War, he replanted his family block and had 900 cocoa trees on an area of 1.44 ha.

He is a short tempered man and, according to his elder brother, he sometimes beats his wife. He used to drink beer but stopped after joining the fundamental Pentecostal religious sect co-headed by his elder brother. He is a reasonably productive and a good manager of resources as head of his family, but his temper often gets the better of him, driving him into conflict even with close friends who assist him in income generating activities.

Prior to my fieldwork period, Jon received contributions of cocoa wet beans from his friend and relative, Naburi, in order to raise money to purchase a secondhand vehicle. These were supplemented by buying extra wet beans from friends and the public. Naburi helps Jon in purchasing and transporting wet beans to the fermentary and in processing and accompanying dried beans to the export depot in Buin town. In the 12 months preceding fieldwork, Jon had processed 26 bags of cocoa beans including contributed and purchased beans. The vehicle for which he was processing beans for was purchased in early 2004. Jon pointed out that he wanted to process some more wet beans so that he would purchase some vehicle accessories and spare parts.

Jon had no private processing facility. In raising money to buy his vehicle, he and his aide, Naburi, processed the wet beans at Sin's (friend and relative) fermentary. Sin charged them a maintenance fee of K5/bag, less than the normal market rate of K10/bag. For all processing rounds,

Box 8.2 (continued)

Sin transported Jon's cocoa beans to the depot. But during high cocoa prices, say K350-K400/bag, Sin would charge K15/bag, and, if prices were relatively low, he charged around K10-K12 /bag.

Such assistance in business and other activities can operate in a more general way, such that a history of mutual support between two individuals can affect how a transporter runs his business and the support he can draw on to maintain his business. For example, one transporter, for instance, pointed out that he was more flexible in the prices he charged his friend, a third degree cousin, with whom he has a history of a harmonious working relationship of mutual support and assistance:

...I make allowance for discounts including my friends...I do this with an eye to ensure future assistance from others...if I don't help others, then they will not help me when I face problems next time, either with my vehicle or in other ways. Sometimes I exchange spare parts such as wheels with friends like Mosi (#32) but not with individuals I'm unaccustomed to in terms of exchanging spare parts. Sometimes when my vehicle is not in use and Mosi needs a wheel, I would remove it from my vehicle and give it to him and he would return it after he gets his work done (12/01/05).

Networks of Support with Relatives and Friends

The relationships of mutual support which are drawn upon to maintain businesses are vulnerable and must be nurtured to keep them intact or to strengthen them. If one party were to disrupt or rupture a relationship of mutual assistance by not reciprocating assistance, the social relationship of mutual support which makes resources and capital available to sustain businesses like transport, will break down thereby closing off sources of labour and capital. The individual not receiving assistance might in the future be reluctant to share resources with the individual perceived as a bad participant in the relationship. The poor state of the relationship might extend beyond the two individuals to the groups with each individual is affiliated (e.g., families), so that there are wider social and economic repercussions for the community in which relationships of support decline.

Some younger and outward going villagers maintain networks beyond clan and tribal boundaries. These encompass friendship relationships with individuals not related by lineage rights and obligations, but yield benefits for the villagers concerned. For example, some villagers borrow funds from friends to buy cocoa wet beans, and secondhand vehicles, and also to exchange secondhand parts for vehicles. Their sense of indebtedness keeps their network ties going.³

8.6 Use of the capital base by Villagers

Farm Tools

The overall capital base of most villagers, in terms of money and farming tools was very low. The overall quality of farming tools was poor: most tools were in a dilapidated state. The few tools (especially, axes and knives) were distributed by AusAID in 1996, with a few acquired from meagre personal savings. The high cost of tools puts them out of the reach of most villagers. But in carrying out farming activities, individuals within families, borrow tools liberally from relatives and friends. For villagers, it is difficult to refuse others' requests to borrow tools for fear of not being able to borrow tools when needed and, as pointed out in Chapter 7 (p.128), there is also the risk of losing status in the village by being considered 'greedy.' However, the liberal borrowing of tools, means that most tools do not last very long.

Villagers' Financial Resources

During my fieldwork, villagers did not have ready access to banking facilities for effective saving of cash. Villagers cannot afford to go to Buka, some 192 km away to deposit small sums at a savings bank agency with the result that money held in the house is immediately available for consumption. This situation is not only an outcome of the Civil War, but a feature of much of the PNG rural socio-economy. However, during fieldwork, I did not come across any important instances of capital saving and investment in the village economy, probably because of the pressing economic needs of most villagers. Generally, capital formation will take some time to build because the villagers' immediate demands exceed their incomes (Chapter 6).

8.7 Summary

This chapter discussed how cocoa production activities (transportation and marketing) are a means to build socio-cultural relationships. Generally, people take great care to ensure that their activities in the market economy do not undermine social relationships. Today, transactions that could be considered to resemble market transactions are almost always mediated through all sorts of social relationships. Transport costs are charged on an *ad hoc* basis depending on market conditions like fuel prices and the prices of cash crops as well as the social context of the transaction in which individuals are involved.

As discussed in Chapter 3, the strategies many cocoa farmers employ in carrying out their production activities are not simply compelled by market forces. They do not work like businessmen with a strong sense of profit-driven urgency or purposefulness, being conscious of the time value of money. Based on observations during fieldwork, the amount of time spent on a cocoa block maintenance (slashing and some pruning) is minimal at less than eight hours per week (cf. Omuru 2001). Villagers spend considerably less time on cocoa production compared with other activities like subsistence production and social activities.

Overall, smallholders do not want to become full-time cocoa farmers. Most, if not all, would see this as a retrograde step where they become tied to cocoa production because of economic necessity. Thus they are not willing to spend a great deal of time working in their blocks and so maintenance and other tasks, tend to be neglected. Cocoa is currently being drawn upon to support a lifestyle that is still very independent of the market.

CHAPTER 9 CONCLUSION AND POLICY IMPLICATIONS

9.0 Introduction

In the final chapter of the thesis, I provide a brief overview of the thesis as a whole, and then highlight the main findings of the research. This is followed by a discussion of policy implications emerging from my findings. In this regard, extension policies need to go beyond usual technical practices to take account of social factors in improving smallholder productivity because, by doing so, extension activities are more likely to be appropriate to the socio-cultural and economic needs of smallholders, leading to higher productivity and improved incomes for smallholders. The chapter concludes with some recommendations for further research by agricultural research institutes in PNG.

9.1 Review of Thesis in Relation to Conclusions and Policy Implications

This thesis has argued that neoclassical economic perspectives do not take sufficient account of the influence of the social in economic practices in rural PNG economies where it is hard to make a distinction between the social and economic spheres. The thesis has attempted, through linking general critiques of basic neoclassical assumptions with social theory ideas, to contribute to a better understanding of rural cocoa production in PNG and to suggest types of rural policies which would be more effective in improving smallholders' productivity and standards of living. By taking into account the socio-cultural, as well as household economic concerns and priorities, for policy purposes, the usual focus on economic incentives could potentially be greatly enhanced through tailoring policies to complement the lifestyles of rural households.

This thesis also highlighted that low smallholder productivity and the absence of a 'business-minded approach' by cocoa households will continue as long as the decision-making processes at the household level remain aligned to the immediate households' needs and priorities, rather than to 'rational' calculations of profit maximisation. Because of the socio-cultural obligations associated with village life

and pressing short-term household needs, some smallholders, despite commercial dictates, do not seem to be arriving at maximising profit-driven productivity increases. Rather, they seem to focus on their short-term cash needs and the socio-cultural demands of village life. This is in stark contrast to the conceptual focus of micro-economics on the 'atomistic rational' behaviour of individuals, and its logic of action based on the profit motive. 'Market' strategies promoting innovation and profit-driven productivity will work up to a point, but their relevance is limited in this context. Thus, the situation of village cocoa farmers requires a conceptually enlightened policy framework that recognises how cocoa production related economic practices are embedded in village societies. The first step is to recognise that farmers are not likely (at least in the near future) to produce at plantation levels of productivity. Based on my observations and field data on the farmers' use of time during my fieldwork, village farmers do not tend to spend eight hours/day on their cocoa blocks. They, however, as noted in Chapter 2, work according to their own priorities and lifestyles, and tend to enjoy the flexibility in the use of their time. Thus, if a farmer has to work 'nine to five' in his cocoa farm, he would probably be unhappy. Policies should seek to enhance the lifestyles of villagers in indigenously defined ways.

I also hope that the understanding gained will also help in terms of guiding approaches by the cocoa industry in assisting growers to increase production, because it is difficult to know what effects industry policy actions towards increasing production, may actually have within the farming households where micro economic decision-making occurs, given issues such as increased household size that are of more immediate concern at the village household level. I support the view that the way forward towards sustainable increases in cocoa productivity, over time, lies in helping farmers to meet their needs and aspirations through policy actions aimed at improved management of their farms but giving due recognition and value to the lifestyles that villagers want to pursue.

Cocoa households in a PNG village smallholder context depend on their social values of solidarity, and of cooperation in one way or another in the face of uncertainty, risk and changing market conditions. This does not mean that farmers do not want to make profits but rather that their desires for profit are tempered by

immediate cash needs often interacting with socio-cultural principles, norms and values. Furthermore, it is unrealistic to insist that smallholder cocoa households must be innovative in order to achieve profit-motivated productivity increases over time when 'market' conditions for innovativeness are lacking in their milieu and when productivity increases may not be a high priority in their lives, given all the other economic and socio-cultural demands on their time and labour. In this situation, industry policy incentives with a direct bearing on smallholder productivity per hectare, such as encouraging high performers through some sort of incentives and/or indirect approaches, may be more effective avenues for enticing households to increase productivity on a per hectare basis.

It is clear that, if constraints on productivity such as land tenure, increasing household size, and pests and diseases, were overcome or minimised, an increase in productivity would probably result, though the productivity gain would be limited by the current traditional demands on villagers' time. To an outsider it might appear that there is surplus labour among cocoa households which can be mobilised to raise productivity, but this may prove difficult because cocoa is grown by everybody for cash and people might be reluctant to work on other people's blocks. It is difficult to recruit labour on labour-short blocks. Because of the smallholder mode of production, labour can be sought from youth, church, women's and men's groups which already exist, which attests to the cooperative nature of villages.

The overall pattern of involvement in the monetary economy covers a wide range of cash-producing activities as I have briefly discussed in Chapter 6. There is a 'non-opportunist' approach to money among villagers and where activities may involve work where returns are relatively high, people can be committed to one crop. Many villagers are not fully committed to cocoa production as a principal source of income if better value alternative crops that help them to meet their socio-cultural obligations and economic needs are available. Although the productivity of cocoa could be readily increased, villagers are hindered by both social and profit constraints as well as by the usual factors related to marketing difficulties. Because of the volatility of the market, villagers do not believe that cocoa should warrant extensive investment of one's time and capital. So, up to a point, the amount of labour invested

in the management of cocoa trees depends on international market conditions over which growers have no control.

It is highly unlikely that cocoa smallholders will be transformed into capitalist producers in the short or medium term by the so-called homogenising influence of global capitalism. But it is true, that, while international market prices are beyond their control, production costs are within their control. However, encouraging farmers to increase productivity in order to cut costs to continue reaping income, does not seem enough, because these production relations remain tangled up with villagers' socio-economic lifeworlds. True, economic wealth empowers individuals in terms of enlarging their choices in pursuing whatever their varied lifestyles may be, which, in the case of cocoa smallholders, as we have noted already, involve the pursuit of both economic and non-economic goals. That there is a need for improved farm management and incomes for maximising material well-being is clear enough, but these cannot simply be underpinned by the profit motive and the need for reinvestment into farms and without this the enlargement of farmers' consumer choices would be difficult.

Importantly, however, it should be pointed out that ignorance of household level priorities in policies to increase government revenue from export cropping may contribute to the failure to attain the research Institute's purpose of improving the standard of living of rural producers. While village level output of cocoa is affected by crop price and farm management and household cash needs, the issue of household level priorities sometimes seems to be assumed to be solely profit-making and economic efficiency. When farmers do not behave as profit maximisers, they are labeled irrational/uneducated or their behaviour is put down to market failure. These are undoubtedly important, but encouragement by the industry to smallholder households to be innovative in order to achieve productivity increases will make more sense only if the 'market' conditions (notably a considerable share of the cocoa market and an entrepreneurial spirit of competition) for innovativeness are present. Reliance on higher cocoa market prices as the driver for innovativeness is not sufficient because prices always change unexpectedly and smallholders are price takers.

Key Findings from the Thesis

Villagers' cash needs that are urgent (short-term) for household consumption and for socio-cultural needs, make long-term investment (e.g., fertilisers and durable farm assets like wheelbarrows) difficult. Outsiders often do not perceive the pressures in the rural areas and the immediate short-term demands that work against villagers' savings. Confronted with changing societal circumstances, it would be silly to assume that villagers are complacent about their lifestyle, and to assume pressures and anxieties of having to meet cash needs are low. This could be true up to a point and to different extents in different rural locations, depending on different levels of accessibility to basic social and economic services. Nevertheless, change creates new cash needs (often short-term) that need to be met in peoples' lives.

Wealth sharing in terms of cocoa beans, cash, processing facilities, and farm tools is prevalent among smallholder families and friends. Farm tools like sariffs, knives, files, knapsack sprayers, and gum boots, are often borrowed liberally by immediate and extended family members, relatives and friends at will. Although it may be said that too many hands result in more speedy depreciation of farm tools than otherwise might be the case, such an aspect of smallholders' lives strengthens and fosters relationships, solidarity, goodwill and friendship among families and individuals in an ongoing way.

Cooperative labour or working together in groups in both cocoa and subsistence production has both social and economic returns to the individuals and groups. Cooperative labour fosters, builds and/or enhances social relationships, economic solidarity among families and the wider community, particularly in times of need (e.g., sickness, food shortages and meeting of school fees).

Cocoa production is also undertaken to meet non-economic goals: brideprice payments, funeral expenses, life-crisis ceremony expenses, traditional ritual ceremonies such as marking a stage of a child's growth, and feasting. This helps maintain one's social status, group identity and solidarity. Such factors temper smallholder farmers' desire to maximise profits from cocoa production. Moreover, such types of social obligations can have both positive and negative impacts on

productivity. That is, they can reduce productivity by drawing away labour and time, while at other times, they can enhance productivity by mobilising labour and time to generate cash to meet such social obligations.

The smallholder transport cost per bag (62.5 kg) of dried cocoa beans is typically 7-12% of the crop price but sometimes this cost is disproportionately shared when cocoa prices rise. Transporters see cocoa as a high value crop and expect to be paid more for its transport, especially when cocoa prices rise. When the value of cocoa falls, transporters find it hard to properly maintain/keep vehicles on the road. There is no reinvestment for repair and maintenance, and most transporters do not spend any money on vehicles when the value of cocoa falls. They may charge just enough to cover fuel costs. Thus, the benefits and costs of high cocoa prices are shared around the village community.

Policy Implications

Promotion of cooperative/group work (e.g., family, youth, church, villagers' mens' and womens' groups) in performing labour tasks in smallholder cocoa production will lift productivity, while enhancing smallholder priorities and their defined needs. Traditionally, extension activities assumed the individual 'rational' farmer, who was expected to allocate resources, especially time, labour and money, accordingly, in cocoa production. But extension works best when it facilitates what is already going on in people's lives. By doing this, extension will promote economic as well as socio-cultural relations (i.e., it has economic and social dividends). This is because cash is needed not only for reinvestment in cocoa farms, but also for traditional expenditures. Group work promotes and strengthens relationships, solidarity and group status, which, particularly in the village smallholder context, are part of peoples' human dignity, identity and well-being. Perhaps, some sort of deduction schemes could be designed based on the collective welfare of villagers, their families and whatever groups are extant in the rural areas.

Extension should look for ways to promote wealth sharing, particularly, the sharing of processing facilities. The Cocoa Board should not penalise farmers who allow relatives and friends to use their processing facilities to earn incomes for

improving their lives. This situation should be accommodated instead of going against the social tide. Extension should recognise the fact that farmers share resources, and should become involved with family groups for training purposes.

Improved rural road infrastructure and transport subsidies are two conventional ways of alleviating the burden of transport costs for farmers. In addition to these, with the support of Cocoa Board, some arrangements between transporters and farmers may be made whereby a certain variable amount per kilogram may be deducted to cover the cost of cocoa transportation, depending on international cocoa prices.

Recommendations for Future Research

The way to increase smallholder productivity per hectare is by helping farmers to meet their priorities and needs, both economic and social. Agricultural research institutes in PNG should therefore take into account smallholders' priorities and needs in the future. One example may be to design payment systems within the appropriate contexts of the various producers (e.g., farmers involved in estate production, and farmers who produce cash crops on customary land), which will promote, not only crop productivity, but also gender equity and social security in smallholder families. In the near future this should form part of PNG agricultural research institutes' research activities in their research endeavours towards fulfilling their ultimate aims of improving incomes and standards of living of rural Papua New Guineans. With hindsight, the potential within the rural peoples' socio-economic structures could be harnessed and put to the service of the aims that PNG commodity research institutes strive to fulfill.

Notes

Chapter 2

¹I would like to acknowledge two important frameworks widely recognised and used in agricultural and development economics which takes into account the socio-economic aspects including the goal of profit maximisation. These are the *Multi-Attribute Utility Theory* (MAUT) and the *Subjective Expected Utility Theory* (SEU). These frameworks recognise that decision makers may have multiple goals including economic goals such as profit and social and environmental aspirations and even risk. These are taken into consideration in examining efficiency and/or productivity aspects. A large body of literature also exists in this area: e.g., Agrawal and Heady 1968; Anderson, Dillon and Hardaker 1981; Bell, Keeney and Raiffa 1977; Benson and Morin 1987; Berbel 1988; Boussard and Petit 1967; Cochrane and Zeleny 1973; Cohon 1978; Cohon and Marks 1973; Dillon 1962, 1971; Dillon and Anderson, J.R. 1971; Hardaker 1996; Rehman and Romero 1987; Bellamy Greenshields 1987). Nevertheless, the said theories cannot adequately deal with the social dimension of production as found in Melanesian societies. The social goals covered in theory cannot adequately account for behaviours where goods, cash and other wealth items are disbursed rather than consumed, such as occurs in Melanesian indigenous exchange relationships.

Chapter 3

¹Cadbury is one of the major chocolate companies based in UK, with strong presence in America and Australia (see <<http://www.cadburyschweppes.com/EN/search>>).

² This is an inflation-adjusted cost.

³The world market distinguishes between two broad categories of cocoa beans: 'fine or flavour' cocoa beans, and 'bulk' or 'ordinary' cocoa beans. As a generalisation, fine or flavour cocoa beans are produced from Criollo or Trinitario cocoa-tree varieties, while bulk cocoa beans come from Forastero trees. The share of fine or flavour cocoa in the total production of cocoa beans is just under five percent/year. The Latin American and Caribbean region supplies 80% of the world's fine or flavour cocoa with Ecuador (producing 60,000 to 70,000 tonnes/year) providing over half the world's total production. Colombia, Indonesia, Venezuela and PNG produce around 10,000 tonnes each. Jamaica, Trinidad and Tobago, Costa Rica and Grenada, each producing between one and 3,000 tonnes/year, are also important growers of fine or flavour cocoa in the Latin American and Caribbean region (ICCO Cocoa Statistics 22 July 1998; September 2003).

⁴The importance of prices is that perceived cost-saving advances induce the technological research which enables substitution. In line with this, agricultural economists tend to argue in favour of intensive culture on the basis of high yields but this argument, as Gilbert and Varagis (2003: 10-11) pointed out, ignores the value of other crops and the possible risk benefit of diversification.

Chapter 5

¹I used the term 'wealth', first, in the context of traditional Buin society to mean, not only shell money and pigs (main symbols of wealth in the past), but inclusive of economic trees then commonly used like almond trees, sago palms, breadfruit trees, as well as forests and rivers. Second, in the present day context, I intended the term 'wealth' to encompass household possessions such as vehicles, chainsaws, permanent houses, tradestores, videos, motor bikes, fermentaries, as well as the accumulation of money and income sources such as cocoa farming, livestock and poultry.

² see, for example, Oliver, D. 1973, *Bougainville, A Personal History*, Melbourne University Press; see also *Thirty five (35) key rules for Bougainvillean bigmen*, <http://www.mc.maricopa.edu/dept/d10/asb/anthro2003/glues/bigmen/rules.html>

³According to Scott Dawson's (Deputy Director General for the Pacific and International Division for AusAID) presentation at *the PNG Economic Update*, held at 01 June, 2006, in Sydney, Australia, PNG had achieved three successive years of economic growth with per capita incomes rising to US\$628 (K1,963) in 2005.

⁴In 1999 the then PNG Cocoa and Coconut Extension Agency (PNG CCEA) estimated holdings at 3.14 ha/grower, relatively higher than the noted previous estimates. Some field officers pointed out that the figure was not really representative of the average village farmer but might be the case in some areas where families planted more cocoa trees due to growing household members. There are some families who keep on planting more and more cocoa trees so long as land is available irrespective of family size because cocoa is the main means of attaining wealth and status in the village.

⁵The information relating to traditional socio-political and economic order of Buin that I used in this part of the thesis is derived mainly from Richard Thurnwald and his wife and co-researcher (Hilde Thurnwald) who carried out ethnographic fieldwork in Buin from 1908-09, and in 1933, after a 25-year time lapse (cf. Jared Keil who did fieldwork in the same area in the early 1970s). From my fieldwork confirmations with older people, and by comparing various scholarly notes and materials from scholars familiar with Bougainvillean societies, notably now retired Professors, Eugene Ogan (1960-), and Oliver Douglas (1930-), the description and analysis of Buin society by the Thurnwalds, at their time, was basically correct. There were some scholarly critiques (see, for instance, review of 'Studies in the Anthropology of Bougainville, Solomon Islands', by Ian Hogbin 1950, In: *American Anthropologist*, New Series, Vol. 52, No. 2, Apr-Jun: 250-1; for a recent critique, see Keil 2005, In: *Bougainville Before the Conflict*, eds. Regan. A. & Griffin, H: 332-45), but these did not seriously invalidate the description and analysis at the time by the Thurnwalds (in this regard, see Whittaker *et al* 1975, Document A14, *Pigs and Shell Money in Buin: Changing Economic Patterns, 1908-34*: 62-4; see also Richard Thurnwald's response to Hogbin (1951), 'Historical Sequences on Bougainville', In: *American Anthropologist*, Vol. 53, No. 1, Jan-Mar: 137-9).

⁶Today, instead of displaying shell money and making lavish pig feasts, such tradition-based attitudes sometimes manifest themselves in terms of possession of modern material goods like motor vehicles, introduced money and other items. So, rationalistic considerations need to be understood within the changing context of the households' way of life.

Chapter 6

¹Four Iamaru villagers were regular gamblers in 2002-03 but were not gambling at the time of fieldwork.

²This was supposed to be shared with the youth group members but the money was misused by the foreman of the contractors who built the church. At the time of fieldwork, they were waiting for repayment by the local MP.

³Betelnut is an important item of sale in many areas of PNG. Buins grow the palm at their home backyards, cocoa blocks and food gardens, or in the bush, but generally, people chew betelnut only occasionally when they want to chew. People tend to buy it for consumption when it becomes scarce but at other times, individuals do not feel compelled to buy it from the market because in the village situation when it is not available for consumption at the time one wants to chew, he/she could easily obtain it from other villagers whether friends or family members.

⁴The small size of the sample only provides some indication of the number of Iamaru villagers' children who were in school during fieldwork. Based on my observations, there could have been as many as 4 children in school per household. It should be noted that many parents were looking forward to enrolling their children in early 2005 when I finished my fieldwork.

Chapter 7

¹The term “social embeddedness” in relation to economic action generally (as noted in Chapter 2, pp.19-20) is associated with Karl Polanyi (1884-1964, <http://artsience.concordia.ca/polanyi/>; see also Block 2000. *Introduction to The Great Transformation by Karl Polanyi*, University of California, Department of Sociology, URL: http://sociology.berkeley.edu/faculty/evans/polanyi_intro.pdf; Mayhew, A. 2000. Review of Karl Polanyi *The Great Transformation: The Political and Economic Origins of Our Time*, Economic History Services, URL: <http://www.eh.net/bookreviews/library/polanyi.shtml>, University of Tennessee). In my thesis, I used the term in Polanyi’s sense, in that, the social and/or cultural in economic actions cannot be easily separated. I found Polanyi’s ‘sense’ useful in terms of understanding rural cocoa households in PNG because he argued that land, labour and money are not simply market commodities (i.e., simply for buying and selling based on market forces of supply and demand in carrying out production activities) which seems to me to be closer to the reality of cocoa households who live in a semi-monetised economy and who sometimes use money in the fulfilment of certain socio-cultural obligations which may be viewed as unproductive spending economically but which sustains their social well-being (Chapter 2: pp.21-5; Chapter 5: pp.74-6, 82-5; Chapters 7-8). As discussed in the thesis, the economy of smallholder cocoa households is not determinant because cocoa farmers are not primarily motivated by economic factors, or simply by the need for income (profit-making). As I argued, farmers want to make profits but their motivations are mixed with a variety of other logics.

²The figure used is based on the 1982 Provincial Government Survey which recorded how much area was under cash crop cultivation at the time. For lack of similar comprehensive surveys, mainly because of the Civil War which began towards the end of the 1980s, and which had affected cash crop farming until 1996, I used the figure to give some reliable approximation of how much area is farmed under cash crops.

³ The number of harvest rounds depends on the cocoa yield. Because production was very low each harvest round in 2004, families were making relatively small harvests of wet beans during 2004 (20-40 kg). Those wishing to process beans would ask their relatives or friends to help them.

⁴This is an illegal activity, prohibited by the PNG Cocoa Board. If the wet bean dealer who is involved in this sort of activity is found out, his dealer’s license would be cancelled. In some senses, it is quite awkward for village farmers not to engage in such activities and, especially in hard times, many probably view such actions as morally appropriate when they have to assist members of their extended families and/or friends to improve their lot.

⁵Gifts of wet beans are mostly reciprocated, although between immediate family members this is not necessarily the case. However, gifts in the village context should not be understood in an individualistic sense, or as having merely an instrumental value attached to them. For villagers, a gift has a deeper meaning embodied in their exchanges of labour and material things which helps sustain their relationships in an ongoing way. Thus, a gift has a more mutually beneficial aspect to it in the context of the villagers’ lives. This is the sense in which contributions of cocoa wet beans to relatives in need are made and will be reciprocated in due course.

⁶The minimum wet bean price at the study site area at the time of fieldwork was K0.60/kg. But villagers buying wet beans prior to the fieldwork went as high as K1.50/kg to K2/kg when cocoa prices were exceptionally high during late 2002.

Chapter 8

¹According to Leigh, A.C. & Locker, L. 2002 [‘Microcredit, Social Capital and Common Pool Resources’, *World Development* 30 (1): 95-105], ‘Social capital’, generally, refers to norms and networks that foster trust, reciprocity and cooperation thereby enhancing both efficiency and well-

being. In the context of PNG rural cocoa households (Chapter 2, pp.21-5; Chapter 5, 75-7, 83-7; Chapter 7-8), existing socio-cultural values, norms, principles and networks of relationships also serve to foster trust, reciprocity and cooperation among cocoa households. Outcomes of this include the fulfillment of a range of social obligations such as payment of school fees and fulfillment of cultural obligations, such as brideprice payments and, improvement in the economic situation of families through assistance by family members, kin and friends in terms of contributions of wet cocoa beans, or contributions of labour, which enhances not only efficiency in terms of getting work activities done, but also social well-being by fostering the socio-cultural dimension of rural cocoa households such as sharing/giving, maintenance of group identity and solidarity (Chapters 7-8).

² The cocoa price limits shown on Table 8.1 are rough indications only based on my interviews with transporters, farmers and some of my own observations during the 12-week fieldwork period. By any means it would be difficult to establish a precise correlation between cocoa price and the transporter discount trigger point, not only because my sample size was small and of short duration, but also because of the influence of social relationships on transport costs in the village context. Nevertheless, these data are based on actual figures and are, at least, accurately represented.

³ In these networks of relationships, I have also observed some information about new cocoa varieties being spread among villagers.

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Appendix 1-a: Cocoa Smallholder Survey in Buin, Bougainville Province, Papua New Guinea

PARTICIPANT CONSENT FORM

Date: .../.../... Name of Farmer: Village:

Local Level Government Area: District: Buin

Province: Bougainville Country: Papua New Guinea

I,, the above named, having understood the information as explained to me by the researcher regarding:

- (i) the voluntary nature of my involvement in this study;
 - (ii) freedom to withdraw from the study without any consequences for myself;
 - (iii) freedom to decline any questions I may not wish to answer;
 - (iv) freedom to withdraw all or any part of any responses I may make to the researcher; and
- (iv) having being reassured by the researcher that my responses will be confidential and that I will not be personally identified in any published work resulting from the interview between myself and the researcher;

I am thereby sufficiently satisfied that I have been adequately informed of my rights, freedom of choice and expression. Further, having trust and confidence in the researcher as a member of my community, I consent to participate in the survey.

Farmer's signature

(.....)

Researcher's signature

(.....)

J Lummani

Appendix 1-b: Written Approval from two Persons identified by their Photos in the Thesis

The Human Research Ethics Committee
Curtin University of Technology

Having met with Mr. Joachim Lummani, and having discussed the matter with him, we, the undersigned, Messrs. Joachim Dising and Peter Makui, have agreed that he should maintain our photos for purposes of his thesis, despite the general statement to the contrary in the Participant Consent Form. Moreover, as an indigenous member of our community, we give him all our support in his research endeavours towards helping the cocoa growing community in our country. We look forward to his success.

Joachim Dising

Peter Makui

.....

.....

7th May 2007

13th September 2006

1.30 pm, Tropicana

Uganno Village, Buin, Bougainville

Kokopo, East New Britain Province

Appendix 1-c: Letter of Consent by Konnou Council of Elders President

28 December 2004

The Human Research Ethics Committee
Curtin University of Technology

Mi, Aloysious Moini, olsem Siaman bilong Konnou Council Of Elders (COE), Mr. Lummani emi bin askim mi long raitim pas long yupela bihain long wanpela kivung emi bin holim long haus garamut long dei 28 bilong mun disemba long ples Iamaru.

Mi laik tok olsem ol farmers insait long eria bilong mi oli hamamas na tok orait long givim bekim long askim bilong em taim oli harim em tok klia long ol raits na fridom bilong ol. Na tu mipela igat trast na konfidens long em olsem memba bilong komuniti bilong mipela na mipela i tok orait long wok wantaim em long wok bilong em.

Mipela i ting olsem wok bilong em inap long halivim mipela ol farmers hia long kakao na Kokonas indastri bilong Bogenvil long niupela gavman nau i wok long kamap.

(.....)

Aloysious Moini
President, Konnou COE.

Appendix 2-a: General Baseline Survey for Village Cocoa and Copra Farmers in Buin

dd mm yy
 Date: ____/____/____ Interviewer: Joachim Lummani Village: _____

LLG: Nomororai Province: Bougainville Name of farmer (household head): _____

District: Buin Farmer ID: Sex: Male Female

Details of Cocoa Block Holdings and Production

Q. 1. Harvest cocoa/coconut from father's block until established own block: Yes No

Table 1: Details of Cocoa Block

No. of cocoa trees	Spacing	Name of cocoa block land	Type of cocoa: SGI, SG2 or hybrid clone	Source of planting material	Year planted	Planted under coconut palms (Y or N)	Other shade	Planted on: 1. customary/ clan land 2. Purchased land 3. somebody's land
Block 1:.....								
Block 2:.....								
Block 3:.....								
Block 4:.....								

Q.2. (i) Main sources of income for male:
 (1) _____ (most important)
 (2) _____
 (3) _____
 (4) _____
 (5) _____ (least important)

(ii) Main sources of income for female
 _____ (most important)

 _____ (least important)

Q.3 (i) Do you have a private cocoa fermentary/drier of your own/family? Yes No

or do you jointly own the fermentary/drier with other farmers? Yes No

(ii) Do you have a private copra drier of your own/family? Yes No

If yes, provide the following: (a) fermentary/drier no: / / / / / / /

(b) capacity of the fermentary/drier: [] bags

(iii) Do you use wantok's fermentary/drier? Yes No

(iv) How many bags of cocoa/copra did you sell over the last 12 months? [] bags

(iii) How much does it usually cost you to dry cocoa beans/copra? K [].00

Table 2: Cocoa/Copra Cost of Production

Activity	Type of worker	No. of workers	No. of days	Rate per day/hour	Total cost (Kina)
Weeding					
Slashing					
Pruning shade					
Chemical cost					
Harvesting					
Picking/hooking (cocoa); picking dry coconuts					
Heaping cocoa/coconuts					
Breaking pods (cocoa); husking & removing copra cream (coconut)					
Sewing wet beans/copra					
Transporting wet beans/copra to fermentary/drier					
Putting beans into fermentary/drier boxes					
Covering wet beans with leaves					
Processing					
Fermenting/drying (copra)					
Drying cocoa					
Packing					
Sewing dry beans/copra bags					
Transport to depot					
Other					

(iv) How many bags of cocoa/copra do you usually harvest during:

(a) flush period? [] bags of cocoa/copra [state type of bags/baskets used]

(b) non-flush period? [] bags of cocoa/copra [state type of bags/baskets used]

Q.4. List four major constraints in cocoa farming:

- (1) _____
- (2) _____
- (3) _____
- (4) _____

Q.5. Cocoa Farm Tools

Table 3: Cocoa Tools

Tools	No. of tools	Cost (K)	Poor condition	Good condition	Very good condition
Cocoa hook					
Bush knife					
Sariff					
Axe					
Wheelbarrow					
Pole pruner					
Pruning saw					
Pruning hook					
Secateur					
Budding knife					
Shovel					
Spade					
Rake					
Knapsack sprayer					
Gum boots					
Weighing scale					
Needle					
Canvass					
Rain coat					

Q.6. Number and Demographic Details of Households

Table 4: Household Demographic Details

Household member	Age	Level of education or already married	Residing with parents	Residing elsewhere
Husband				
Wife				
1 st born				
2 nd born				
3 rd born				
4 th born				
5 th child				
6 th child				
7 th child				
8 th child				
9 th child				
10 th child				
11 th child				
12 th child				

Note: duplicate if several households within a family (e.g. father, son, wife & kids).

Q.7. Has your family adopted any children? Yes No

7.1 If yes, how many? [] boy/girl (s) → write the numeric answer and circle the appropriate sex.

Q.8 (a) Are you a member of a cooperative or support group? Yes No

For example: Youth group (e.g. soccer club)

Church group

Others (specify)

Indicate by name here:

(b) State the ways in which your group members help one another e.g. leaving aside cocoa for your group member to harvest for sale as wet/dry beans, slashing, housing construction etc.

Q.9 Details on Off-Farm Income

Since last week to date, did you earn any money from the following:

Table 5: Details on Off-Farm Income

Type of crop sold	Seller: male (m); female (f)	Relationship in family (e.g. husband, son, etc.)	Quantity sold	Price (K)	Where did you sell the crop?
Coconut					
Vanilla					
Other					
Greens					
Libika					
Pumpkin Tips					
Ferns					
Other					
Food crops					
Kaukau					
Taro					
Banana					
Yam					
Singapore					
Sugar cane					
Pawpaw					
Protein Food					
Fish					
Butchered raw wild pig meat					
Cooked pig meat					
Raw domestic pig meat					
Wild fowl eggs					
Possum					
Prawns					
Eel					
Chicken					
Other					

Since last week to date, did you earn any money from the following sources:

Table 6: Alternative Sources of Income

Item	Amount usually earned (K)	rarely (R); frequently (F); sometimes (S); once in a while (W).	Earn money from it regularly: indicate by a tick (✓) whichever is applicable.	
			Yes	No
Sale of food at the market			()	()
Trade store			()	()
Sale of Kerosene			()	()
Sale of some, rice and biscuit, second hand clothes			()	()
Sale of home made bread			()	()
Sale of pigs			()	()
Sale of chicken			()	()
Sale of fish			()	()
Gambling			()	()
Contract work			()	()
Remittances			()	()
Other			()	()

Q.10 If any of your family members work in a company, government, or somebody, indicate your relationship to him/her, and state the type of work:

Family member: father, mother, son, daughter, nephew, niece, brother or other	Type of work

Do they provide support for the family? Yes No

Q.11. List in order of importance the type of activities your family earns income from:

- 1 _____
- 2 _____
- 3 _____
4. _____

Q.12. What type of activities does your wife usually earns income from?

Training of Farmers and Extension Activities

Q.13 In the last 12 months, did you or any of your family members receive training or some advice regarding the following?

Training and advice on:	Yes (Y) or No (N)	Source of advice/training	If you think training was good, or not very good, indicate by a tick (✓) whichever is applicable.	
			Good	Not very good
New hybrid cocoa clone			()	()
Rehabilitation			()	()
Pruning			()	()
Pest and disease management			()	()
Cocoa shade			()	()
Weed control			()	()
Managing cocoa			()	()

Q.14 Why do you think that the training on cocoa provided by the extension officers was not very good?

Q.15 Do you have any other questions you would like to ask or do you have any general comments to make?

Q.16 Interviewer's comments

Appendix 2-b: Baseline Survey of Village Cocoa Farmers Regarding Transport

dd mm yy

Date: ____/____/____ Interviewer: Joachim Lummani Village: _____

LLG: _____ Province: Bougainville Farmer's name (household head): _____

District: Byin Farmer ID: Sex: Male Female

Q.1. Transport

(a) Do you have a vehicle? Yes No → go to Q.2.

(b) If yes, did you borrow money from elsewhere to buy the vehicle? Yes No

If yes, from whom? _____

or

(c) Do you and other people jointly own the vehicle? Yes No

(d) What is your vehicle used for?

Table 1: Types of activities and the associated costs (K)

Type of activity	Indicate by a tick (✓) whichever is applicable.		Frequency of activity/month	Usual charge (Kina)
	Yes	NO		
Transport cocoa	()	()		
Government contract work	()	()		
Taking women in the family to the market	()	()		
Taking people to the market	()	()		
Taking sick people to the hospital	()	()		
Taking school supplies	()	()		
Taking firewood for drying cocoa	()	()		
Taking timber or wood for building a house	()	()		
Taking people on a private business trip	()	()		
Taking people's trade store cargo	()	()		
Others (specify)	()	()		

Q-2. Transport price of dried cocoa beans to buyers in town in relation to copra, food crops and supplies.

Dry Cocoa Beans

How much do you normally pay for transportation of:

- (1) cocoa to the market place/depot? K [] .00 per load
- (2) copra to the market place/depot? K [] .00 "
- (3) garden food to the market place? K [] .00 "
- (4) supplies from town?
 - (4 a) Buka- Buin? K [] .00 "
 - (4 b) Arawa- Buin? K [] .00 "
 - (4 c) Konga- Buin? K [] .00 "
 - (4 d) Buin- village? K [] .00 "
 - (4 e) Other (specify) K [] .00 "

(b) How do you consider the charge?

- (b₁) Low
- (b₂) just okay
- (b₃) high
- (b₄) very high
- (b₅) too high to use

(c₁) or you tend to use the same vehicle?

- (a) no, whatever vehicle is available
- (b) whatever vehicle has lowest price
- (c) most of the time
- (d) all the time

(c₂) Indicate the reasons for c₁. *Note to interviewer:* use your note book if you have a long answer:

Note: use specific examples/examples of specific instances for the relevant scenarios.

- it is the cheapest vehicle around the place;
- vehicles are not readily available ;
- vehicle owner is a kind person who usually helps me when I call on him (get a range of examples);
- vehicle owner is not a miser who charges a very high price or profiteer (examples);
- vehicle owner is considerate of the economic circumstances of the farmers (examples of specific instances);
- very good personal friend of mine who helps me in a lot of things (why & give examples of help);

- a close relative e.g. same line, tambu, etc (what sort of obligations do these entail?);
- he is a member of my family;
- business partner; and
- others.

(c4) Do you know the prices charged for hiring other vehicles in the village? Yes No

(c5) Does the transport cost vary with changes in the price of cocoa/copra? Yes No

(c6) If yes, by how much? Provide estimates or give examples of specific fares you know about. _____

Q.3 Factors that affect the prices charged for (i) transport, (ii) fermentary/dryer, (iii) usage of cocoa tools, machinery, etc:

Note to interviewer: provide scenarios, and use your note book if you have long answers.

Q.4 Do you have any other questions you would like to ask or do you have any general comments to make?

Q.5 Interviewer's comments

Appendix 2-c: Survey of Marketing of Export Cash Crops

dd mm yy
 Date: ____/____/____ Interviewer: Joachim Lummani Village: _____
 LLG: _____ Province: Bougainville Farmer's name: _____
 District: Buin Farmer ID: Sex: Male Female

The Marketing of Cocoa and Copra Produce**Wet Bean Cocoa and Green Copra**

1. Indicate whichever is applicable in your case.
- 1.1 Does the cocoa wet bean/copra dealer, comes to your block area with or without his vehicle to weigh your cocoa/copra?
- (a) Never (b) once a year (c) 2 or 3 times a year (d) 4 or more times a year
 (e) every time I harvest
- 1.1.1 If a buyer comes to your block, does he pay a lower price for your cocoa? Yes No
- 1.1.2 If you indicate (a), (b), (c) or (e), do you usually take your wet bean cocoa/copra to a buying point? (provide the name of the buying point):
- (i) within your area of the main road (road side buying point): _____
 (ii) at some bulk building central location near your farm/village: _____
 (iii) other (specify): _____
- 1.1.3 How do you take your produce to the buying point indicated above?
- (a) by vehicle (b) by wheelbarrow (c) by foot/shoulder
 (d) other (specify) _____
- 1.1.4 Do you usually accompany your produce or take your wet bean cocoa/copra to the market or the point of sale/buying point yourself?
- (a) Never (b) once a year (c) 2 or 3 times a year (d) 4 or more times a year
 (e) every time I harvest

1.1.5 When you do not accompany your produce to the market, who usually accompany your produce to the market, and why?

Name: _____

Other (s): _____

Relationship: _____

Relationship: _____

1.1.6 Do you usually pay the helper?

(a) rarely (b) once in a while (c) only sometimes (d) a lot of times (e) many times

(f) always (g) most of the time (h) every time he/she helps me (i) no

How do you pay him/her (if any)? (i) Cash (ii) In kind

Other (explain): _____

State amount usually paid: K [] .00

State amount paid: K [] .00

Reason: _____

Reason _____

1.1.7 If you do not pay or pay in other ways, please explain below (Note: use your note book if you have a long answer):

1.1.8 Does your wet bean cocoa/copra ever get spoilt due to lack of transport? Yes No

1.1.8.1 How many times in the past 12 months? _____

Dry Bean Cocoa/Copra

2. Do you accompany your dried cocoa beans/copra to the market depot in Buin town yourself?

(a) Never (b) once a year (c) 2 or 3 times a year (d) 4 or more times a year

(e) every time I dry beans/copra

2.1 If you indicate (d), (c), (f), (g), or (h), how much do you usually pay for transport?

(i) Transport by public motor vehicle: K [] .00

(ii) Hired transport: K [] .00

(iii) Other (specify) and state cost: _____

2.1.1 When you do not accompany your produce to the market, who usually accompany your produce to the market and why?

Name: _____ Other (s): _____

Relationship: _____ Relationship: _____

2.1.2 Do you usually pay the helper?

- (a) rarely (b) once in a while (c) only sometimes (d) a lot of times (e) many times
- (f) always (g) most of the time (h) every time he/she helps me (i) no

2.1.3 Does the quality or how close your relationship is with the helper sometimes influence how much you pay? Please explain:

Note: ask for lots of examples

2.1.4 How do you usually pay (if any)? (i) Cash (ii) In kind

State amount usually paid: K [] .00

State amount usually paid: K [] .00

Reason: _____

Reason _____

2.1.5 If you do not pay or pay in other ways, please explain below (Interviewer: use your note book if you have a long answer):

2.1.6 Indicate when if there is any time your wet bean cocoa/copra got spoilt due to lack of transport? _____

2.2 Is there any middle men involved in selling your crop? Yes No

2.2.1 If Yes, does the middle man sell your crop regularly? Yes No

2.2.2 Provide comments (if any) in the space provided below if there is a need to elaborate and/or explain further.

3. Do you have any comments to make regarding the marketing of your crop?

Potential for economies of scale

4.0 Do you sell low volumes? Yes No

4.1 Do you store your produce until the volume is sufficient for you to sell? Yes No

4.2 Do you have any other ways of maintaining a sufficient volume for your crop: for example, via cooperative activities with other farmers. Please explain (if any).

5.0 Comments by interviewer

Appendix 2-d: Weekly Monitoring Survey of Cocoa Farmers

dd mm yy
 Date: / / / Interviewer: Joachim Lummani Village: _____
 LLG: _____ Province: Bougainville Name of farmer (Household head): _____
 District: Buin Farmer ID: Sex: Male Female

Question 1.0 Since last Monday to date, did you:

- (a) sell any wet beans? Yes No
 (b) sell any dry beans? Yes No
 (c) harvested any beans currently in fermentation boxes? Yes No

Wet beans

Dry beans

Question 2.0 (i) Income from the sale of wet beans:

Kg _____

Price per kilogram: K _____

Total kina _____

(ii) Where did you sell it? _____

Question 3.0 (i) Income from the sale of dry beans:

Kg _____

Price per kilogram: K _____

Total kina .. _____

(ii) Where did you sell it? _____

Question 4.0 Cost of Production for cocoa

Table 1: Cost of Production for Cocoa

Activity	Family members (FM) ; Piece rate worker (PRW); Regular worker (RVV); Other (specify)	No. of workers	No. of days worked	Rate per day/hour	No. of days/hours worked	Total Cost (K)
Weeding						
Slashing						
Pruning shade						
Pruning cocoa						
Chemical cost						
Harvesting						
Processing						
Fermenting						
Drying						
Packing						
Other						

Table 2: Cost of Production for copra

Activity	Family members (FM) ; Piece rate worker (PRW); Regular worker (RW); Other (specify)	No. of workers	No. of days worked	Rate per day/ hr	No. of hrs/days worked	Total Cost (K)
Weeding						
Slashing						
Grass cutting						
Chemical usage						
Harvesting						
Processing						
Drying						
Packing						
Other						

Question 5.0 Transport and Marketing. *Note:* if the farmer uses own vehicle for transportation, skip Question 4.0.

(a) State your relationship to transport provider: _____

(b) State the charge (kina) for the following activities (if applicable) and also indicate how you consider the charge.

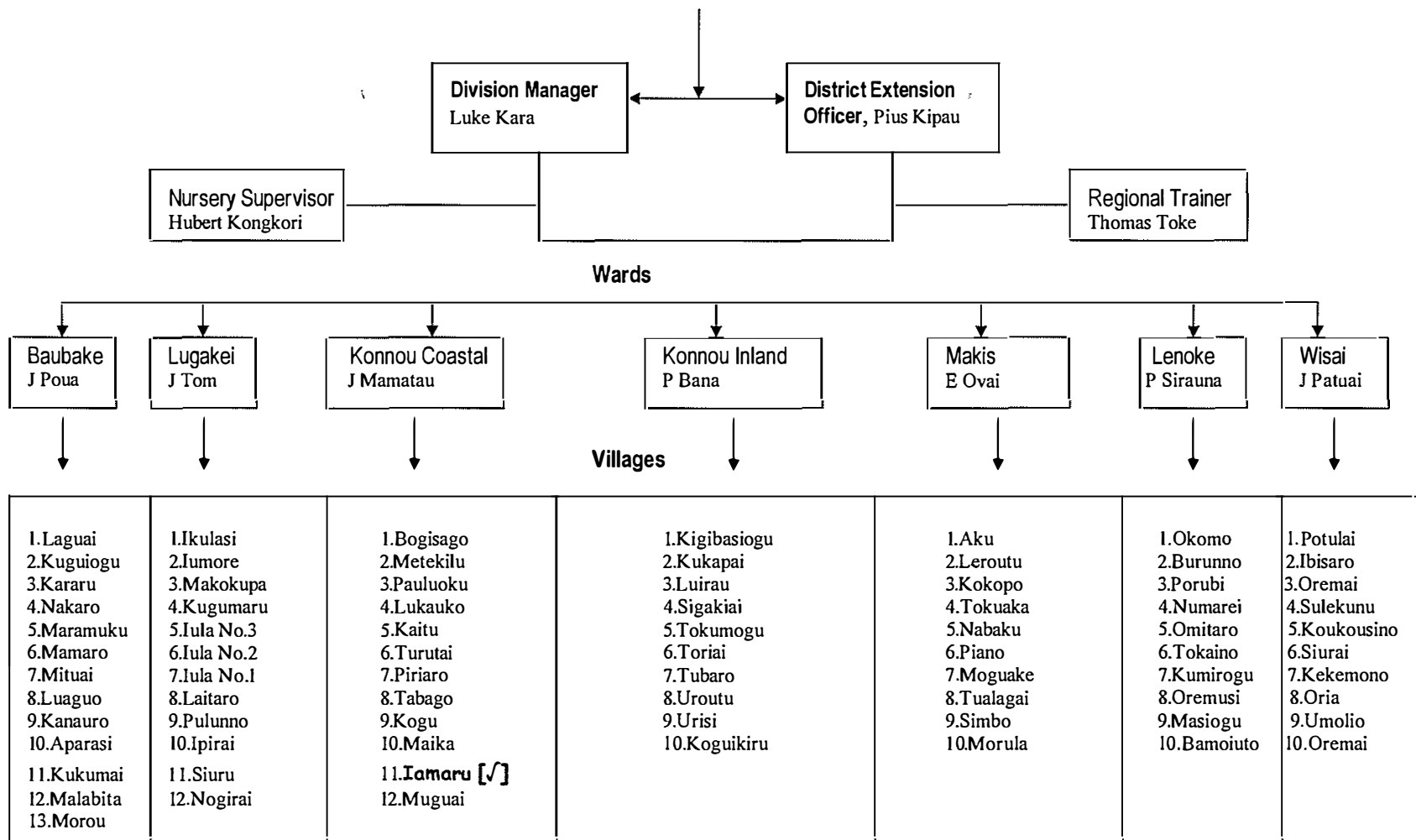
Activity	Charge	low	just okay	high	very high	too high
Firewood to fermentary/dryer	K [____].00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation of wet bean cocoa/copra to fermentary/dryer (includes purchased beans/copra)	K [____].00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation of dry beans/copra to market (Circle either Buin town, Kieta, Buka or Rabaul)	K [____].00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Give some reasons for hiring or using this particular vehicle for transportation purposes:

Appendix 3: Cocoa and Coconut Institute of Papua New Guinea

Industry Services Division

Buin District Structure



{Source: CCIPNG Branch, Buika, Bougainville Province. Note: some villages are subsumed under the given village names}

