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**SUBSISTENCE FOOD PRODUCTION AND MARKETING
IN
PAPUA NEW GUINEA**

A research paper presented in partial fulfilment of the requirements for the degree of Master of Philosophy in Development Studies at Massey University.

by

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ABSTRACT

Agriculture is the main component of the economic sector of the Less Developed Countries (LDC's) of Asia, Africa and Latin America. In most of these countries, which includes Papua New Guinea (PNG), subsistence agriculture dominates despite the tremendous advances in agricultural technology elsewhere, especially in Developed Countries, in the course of the twentieth century. The characteristic feature of these subsistence farms is low productivity which means small, if any, production surplus over consumption, which results in very little trade between the agriculture sector and other sectors of the country. In LDC's, this has often led to declining food production and increased dependence on imported food as the bulk of domestic food supply is produced by the subsistence sector. In PNG, very similar trends are noted.

This paper examines some issues affecting smallholder agriculture and implications for increasing agricultural productivity in PNG. Specifically, the research problem and the focus of this study is firstly, how to increase subsistence food production and secondly, how to effectively move the rural surplus to urban consumers where it is required.

To increase productivity, LDC's are faced with two choices; extend land area under cultivation if land is available or improve agricultural technology if land is scarce. While PNG is relatively well endowed with land (more than four times the average for developing countries), much of the land is too mountainous to convert to arable land, with only less than 0.3 per cent of the land used for annual crops and grazing. The choice of strategy thus is determined by land.

This paper shows that the PNG government has under-invested in agriculture, particularly subsistence agriculture. Further investment in research and technology is required, focusing especially on their farming systems. Traditional farmers are not traditionalist by choice. Agricultural techniques have been developed over centuries, through years of accumulated experience of generations of farmers. Extensive literature in agriculture economics show that traditional farmers cannot normally adopt technological innovations unless the circumstances in which they operate are first changed.

The important role of marketing in economic development is also underplayed. It is a common fallacy to assume that markets when left to their own devices can lead to increased productivity and efficiency within the distribution system. Government intervention is also necessary in marketing to achieve social goals of self sufficiency in food production. This study attempts to demonstrate that given the right incentives, mostly institutional and technological, subsistence food production can be increased in PNG.

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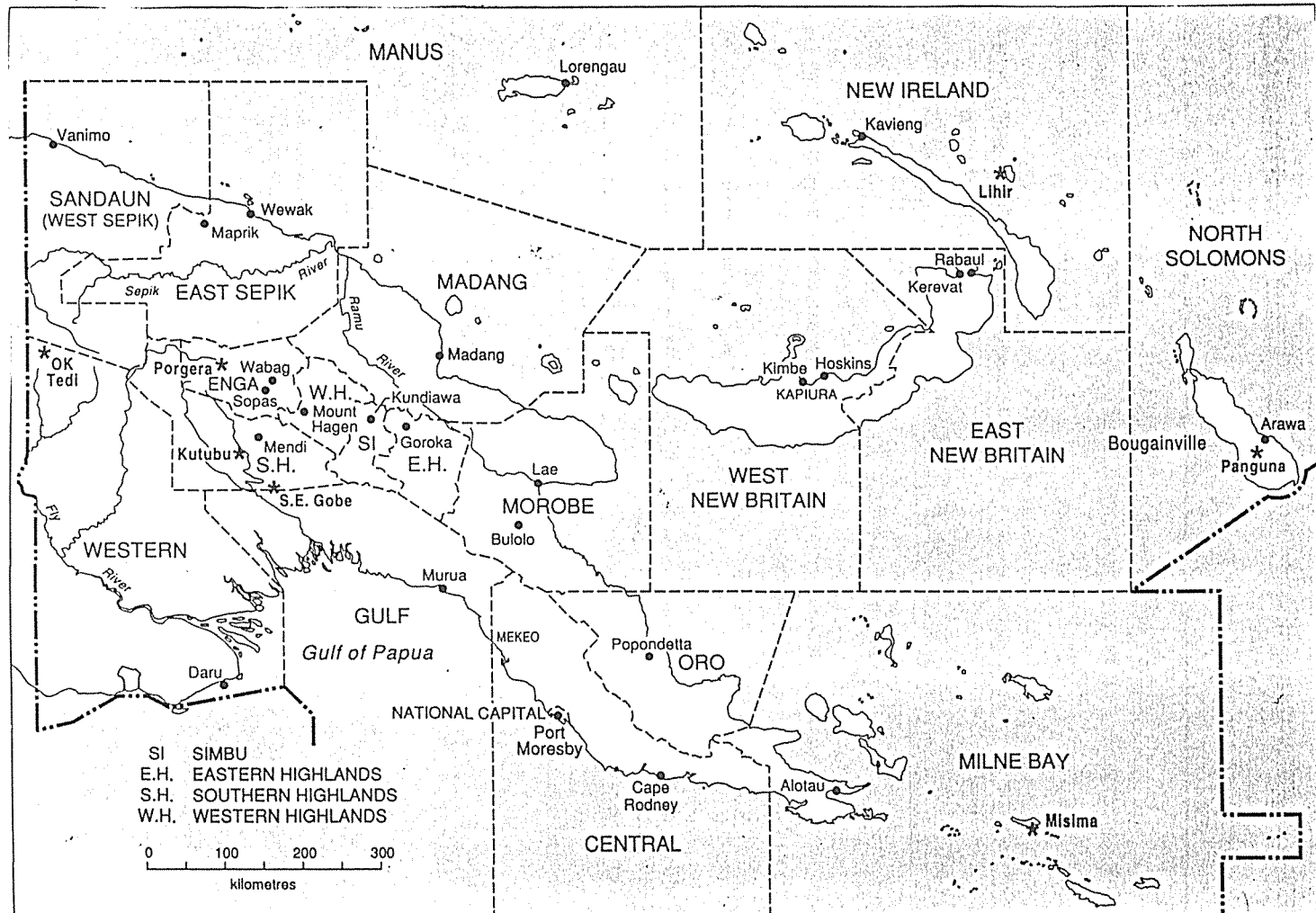
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LIST OF ABBREVIATIONS

- ADB - Asian Development Bank
- DC - Developed Countries
- FAO - Food and Agriculture Organisation
- FPDC - Fresh Produce Development Company
- FSR - Farming Systems Research
- IFAD - International Fund For Agricultural Developemnt
- LDC - Less Developed Countries
- NPO - National Planning Office (PNG)
- NSO - National Statistical Office (PNG)
- PNG - Papua New Guinea
- UNDP - United Nations Developemnt Programme

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MAP OF PAPUA NEW GUINEA



CHAPTER ONE

INTRODUCTION

ECONOMIC GROWTH AND PERFORMANCE

PNG's economic performance in the 1960's was above average for developing countries. Since then, however, it has performed poorly, both in absolute terms and relative to other economies within the Pacific region (table 1) as well as outside the region (table 2).

Table 1. GNP Per Capita Real Growth Rates for Pacific Island Economics, 1989-90 in Percent

Country	Growth Rate
Papua New Guinea	-0.5
Solomon Islands	3.4
Fiji	-0.4
Kiribati	1.7
Tonga	1.5
Vanuatu	0.5
Western Samoa	1.2

Source: Commonwealth Secretariat, 1992

Table 2. Growth in real GDP per capita, Papua New Guinea, sub-Saharan Africa and all developing economies, 1965-86 (per cent per year)

	1965-73	1973-80	1980-86
Papua New Guinea	4.2	-1.0	-0.5
Developing Countries	3.9	3.1	1.5
Sub-Sahara Africa *	3.7	0.7	-2.9

* Excluding S. Africa

Source: World Bank, World Development Report, New York, Oxford University Press, 1988.

Since the mid-1970's, three notable features emerge. Firstly, there has been slow economic growth despite large increases in export, especially mineral exports. Secondly, there is rapid structural transformation despite the slowness of growth. Thirdly, there has been aggregate decline in agricultural production, particularly food production despite increases in non-food agricultural production (table 3).¹

Since the 1960's, agriculture's share of GDP has declined from more than 40% to around 30% in the 1980's. According to the United Nations Food and Agriculture organisation, food production in PNG only grew by 24% compared to 36% for all developing countries, which represented a 7% decline for PNG, compared to 5%

1. Food includes traditional lines such as sweet potato, taro, yams, casava, bananas, coconuts and many others as well as introduced crops like potatoes, oranges, cole crop vegetables and other temperate crops.

increases for all developing countries, and 12% for all East Asian market economies. Subsistence food production has declined from more than one-quarter to less than one-seventh of total GDP and from nearly two-thirds of agricultural GDP to less than one-half of agricultural GDP.

Table 3. Food and agricultural production in PNG and other developing economies, 1975-86

	Food		All agricultural	
	Total	Per capita	Total	Per capita
Papua New Guinea				
1975	100	100	100	100
1980	109	95	113	98
1986	124	93	127	95
All Developing *				
1975	100	100	100	100
1980	115	101	114	101
1986	136	105	134	103
E.Asian Developing *				
1975	100	100	100	100
1980	116	103	116	104
1986	142	112	141	112
Indonesia				
1975	100	100	100	100
1980	127	114	128	115
1986	168	135	169	135

* Excluding China

Source: FAO, Production Yearbook, Rome, 1986

Meanwhile the demand for food has increased rapidly in major urban areas. A review by ANZDEC Limited (1991) on the fruit and vegetable industry in PNG revealed a growth in demand of 11 percent per annum. From December 1987 to March 1991, total growth in demand increased by 38 percent. This figures only represents growth in the formal markets and does not include produce which goes through the informal (periodic) markets. A study by the Asian Development Bank (1989) noted that approximately twice as much produce flows through informal markets as does through formal markets (table 4, 5).

Table 4. Formal Market Demand for Introduced Fruit and Vegetables, March 1991 (tonnes).

Commodity	Port Moresby	Lae	Other Centres	Total
Broccoli	153	110	92	355
Cabbage-English	443	265	295	1003
Cabbage-Other	122	95	118	335
Capsicum	149	86	43	278
Carrot	253	135	155	543
Cucumber	110	47	49	206
Lettuce	255	105	91	451
Onion	1900	432	404	2736
Other Vegetables	468	226	336	1131
Potato	3801	1149	2313	7262
Pumkin	131	71	111	313
Tomato	349	139	54	542
Not Specified	114	74	90	278
	8349	2934	4150	15433

Source: ANZDEC Limited, "The Fresh Produce Development Company: Papua New Guinea", Auckland, 1991.

Table 5. Formal Market Demand for Introduced Fruit and Vegetables, December 1987 (tonnes).

Commodity	Port Moresby	Lae	Other Centres	Total
Broccoli	3	32	6	41
Cabbage-English	478	198	129	805
Cabbage-Other	155	8	33	197
Capsicum	64	13	8	85
Carrot	326	128	94	548
Cucumber	89	33	14	136
Lettuce	113	77	35	225
Onion	783	789	663	2235
Other Vegetables	235	208	112	555
Potato	3020	1742	293	5055
Pumkin	110	64	26	200
Tomato	213	56	34	303
Not Specified	473	332	159	964
	6072	3564	1570	11206

Source: ANZDEC Limited, "The Fresh Produce Development Company: Papua New Guinea", Auckland, 1991.

SUBSISTENCE FOOD PRODUCTION

The bulk of food in PNG is produced by the 85% of the population that are rural based. These subsistence producers currently produce non-food cash crops for their monetary requirements while remaining self sufficient in food production.² Several studies

2. Household consumption includes production utilized as feed for livestock. In some areas where pigs are important for prestatation, production is planned according the feed requirements. See Yen, E.D., 1980, "Other Infrastructure Developments" , Ward, R.G. and Proctor, A. (eds) in South Pacific Agriculture; Choices and Constraints, Australian National University, Australian National University Press , Canberra.

have been conducted on subsistence food production and marketing in PNG. These studies indicate that very little production surplus is available to these producers which is then sold occasionally in nearby periodic markets (Shaw, 1985; Epstein, 1983; denseley, 1977). This surplus is inadequate for the urban consumers, who meanwhile have to depend on imported food. According to the National Planning Office (1980:19) approximately three quarters of the food consumed in Port Moresby was imported. This trend is similar in other urban centres and has not changed much in recent years. Jarrett and Anderson (1989) noted a steady growth of 4% in food imports since 1975. ³

Similar studies have been carried out in other Pacific Island economies (Eele, 1978; Bathgate, 1978 in the Solomons ; Tafatu 1978; Walsh, 1974 in Niue; Bonnemaision, 1978 in Vanuatu and New Caledonia; Wai, 1987 in Western Samoa and Thaman, 1978 in Tonga). Some have focused on production and marketing (Chandra, 1978; Bollard, 1978) while others have focused broadly on traditional agriculture and urbanisation in the Pacific (Fisk, 1978). These studies indicate that food problems faced in PNG are similar to those faced by other economies in the Pacific and are brought about by increased urbanisation and population growth in the region.

3. Some food will have to be imported due to the preferences of different segments of the market especially the large expatriate population.

In PNG, there is very strong evidence that subsistence food producers will respond to this shortfall given the right incentives. A study of eight highlands villages concluded that villagers in this survey had a very strong desire for cash and little interest to supplement their diets with subsistence crops (Harris, 1975). Similar conclusions were reached by Kern et al. (1984) in studies in four provinces where villagers indicated preference for cash, markets and infrastructure. The Food and Agriculture Organisation/United Nations Development Programme (1983) also commented that most demands from rural areas were for better roads, improved communications and higher incomes for agricultural crops.

RESEARCH FOCUS AND OBJECTIVES

Declining food production, especially subsistence food production is of concern to the PNG government. Many politicians and other leaders in PNG believe it is morally wrong or shameful for the country to import food. Several reasons are noted as important for rapidly increasing food production in PNG.

Firstly, for self sufficiency in food production. This is particularly important for domestic staples including fruit and vegetables which are currently being imported but can be produced by smallholder producers.

Secondly, it is important for foreign exchange savings and creation of rural employment. According to the National Planning Office (1982), formal employment is unable to absorb more than 10 percent of the economically active population entering the labour market each year. This will require an increasing amount of agricultural and rurally-based income-earning opportunities.

Thirdly, increased production will lead to higher incomes and improved standards of living which results in enlarging the domestic market for local products. Finally, neglect of the rural poor may lead to unrest and violence as evidenced by the present high social tensions and crime rates.

The research objective is to determine the implications for increasing subsistence food production in PNG. More specifically, the first part of the paper seeks to explain why food production is important to PNG's economic growth and attempts to show how food production may be increased and sustained. The second part of the paper considers the food distribution system in PNG, particularly food marketing problems at macro (country) and micro (smallholder) level to determine how the rural food surplus may be effectively moved to urban consumers where it is required. This paper will determine whether adequate resources are being committed by the PNG government, in terms of production and marketing incentives, to increase smallholder food production in PNG.

SCOPE AND LIMITATIONS

National development goals and agricultural strategies are expressed through national policies and implemented through policy instruments (taxes, credit, subsidies, and so forth) which affect the production process in a variety of ways and the specific agro-industries or sectors. These macro policies can be grouped together in the following categories: fiscal (revenues and expenditure), monetary (credit and interest), trade (foreign exchange and import/export control), and income (prices and wages).

The implications of each of these policies are important in determining an overall agricultural development strategy, especially to increase food production. They can alter access to inputs and markets, costs and types of inputs, competition and prices. These macro-policies, however, are not discussed because they are beyond the scope of this paper.

This study focuses only on fiscal policies, particularly public investment decisions to increase agricultural production in PNG.

STRUCTURE AND ORGANISATION

Why is agriculture important? The most important reason is its contribution to industrialization. Industrialization is one

objective of every developing country. A characteristic feature of developed and developing countries is the relative position of agriculture and industry in their economies. In developing countries agriculture generally accounts for the major proportion of national income, employment and exports, while manufacturing and other industries play as yet a small part in the economy. In developed countries, the position is reversed, and the non-agricultural sector predominates.

Because of the diminishing relative importance of agriculture as development progresses, there has sometimes been a tendency to identify economic development with industrialization and to devote insufficient resources to the agricultural sector. However, it has increasingly been realized that agriculture and industry are mutually dependent. In the 1960's, experience in a number of developing countries demonstrated that a lagging agricultural sector may jeopardize industrialization and overall growth within the economy.

The reason is attributable to the multifaceted role agriculture plays in providing requisite resources for economic growth in less developed countries. Among other reasons, healthy agricultural development can reduce poverty, provide food and earn necessary foreign exchange. It employs more people than other industries, often up to 60 to 70 percent and or more. By contrast agriculture employs less than 10 percent of the workforce in developed countries.

The role of agriculture in economic development is broadly examined in chapter 2. I have used Taiwan as a country case simply to illustrate forward linkages with other sectors of the economy. In addition, Taiwan is one of the few successful developing countries to undertake a comprehensive national effort to develop food production and achieved food self sufficiency leading to exports of the surplus. Much of this increase was achieved through investment in agricultural technology as much of Taiwan's land area is mountainous and not readily accessible to farming (excluding forestry) as is the case in PNG. It achieved high economic growth rates based on agriculture. Resource inflow into the agricultural sector, while also important for agricultural development, is not discussed in this paper.

Having noted why agricultural production, particularly food production is important for a country's development aspirations, we will consider why food production in PNG has declined. Chapter 3 examines some of these reasons.

How may subsistence food production may be increased? Chapter 4 looks broadly at the economics of traditional farming and considers the implications for expanding subsistence food production.

Available evidence suggests that traditional farmers cannot normally adopt technological innovations unless the circumstances in which they operate are changed first (Shultz, 1964; Mellor,

1978, Arnon, 1981). Chapter 5 looks at PNG government's efforts to increase smallholder productivity by examining investments in research and extension.

Chapter 6 looks at future directions in research and extension. It focuses on Farming Systems Research (FSR) as an appropriate means of transferring technology to smallholders.

Chapter 7 examines government intervention in the form of public investments in marketing and considers implications for developing a efficient food marketing structure within the country.

Chapter 8 focuses on smallholder marketing problems and considers possible solutions.

PNG's declining food production problems are not unique. One of the major problems of development is to tap an increasing rural food surplus from an agricultural sector which is declining , if not absolutely, then at least in terms of per capita. Chapter 9 examines how other developing countries achieved food self sufficiency. It examines four country cases, each with a large rural based population and considers the programmes used to increase food production.

In Chapter 10 it will be shown that an agricultural development strategy should focus on agricultural research leading to

farming practices; extension; assured markets; and input supplies for farmers.

Chapter 11 attempts to consolidate all these information into a policy framework with specific policy tasks and programmes that may be used to increase subsistence food production in PNG.