RICE IN PAPUA NEW GUINEA – AN ECONOMIC EVALUATION

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INTRODUCTION

The subject of rice is often in the news in Papua New Guinea. Practically everyone eats it and yet it is almost entirely imported - and these imports are rising. In 1963 less than 30,000 tonnes of rice were imported into Papua New Guinea; by 1985 this had risen to nearly 110,000 tonnes.

Rice has been grown on and off for 95 years in Papua New Guinea. There have been rice projects in Kokopo, Alexishaven, in the Mekeo, Gulf, Talasea and in Milne Bay. They have all failed. Common features in all the failures have been:

- the large amount of labour required to grow rice
- the poor returns to investment (a low price for the crop compared with the cost of producing it).

For example, 20 ha of irrigated rice in Alexishaven was abandoned after 3 years in 1913. The cost of labour was too high. Fifty years later commercial rice in Milne Bay was abandoned for the same reason.

Although these rice projects have failed, many people still think that Papua New Guinea should grow its own rice. For this reason D.P.I. invited the Food and Agriculture Organisation of the UN (FAO) to send a team of advisors to look at rice in Papua New Guinea. The team's job was to assess the costs and benefits of different policies towards rice.

A team of economists visited Papua New Guinea in October and November 1985. They toured the rice-growing provinces and had discussions with the concerned Departments. Their report is now complete. The conclusions of the report are discussed in this article.

Rice ready for harvesting. Rice has become a major food item in Papua New Guinea, yet most of it is imported. Should we produce our own rice?

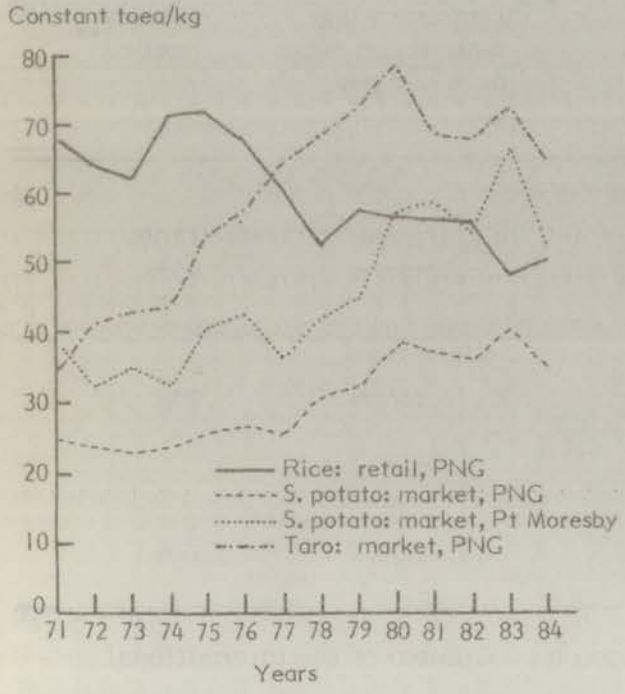
CONSUMPTION

Papua New Guineans choose to eat rice because, compared to traditional staples, it has the following advantages:

- it is less bulky and therefore easier to carry
- it stores better
- it is easier to prepare and cook
- it is often cheaper.

The graph below compares the price of rice (in toea per kilogram) with the price of sweet potato and taro in urban (town) markets. It shows that rice is cheaper than taro, and in Port Moresby rice is also cheaper than sweet potato. Nationwide, rice is now only a little more expensive than sweet potato. If we compare the price of rice and the price of traditional staples according to their nutritional value we find that rice always works out cheapest in urban areas.

As incomes have risen, so people have eaten more rice. The amount of rice eaten in Papua New Guinea is expected to continue to rise. The FAO team estimated that by 1995 we could be importing as much as 200,000 tonnes per year.



This graph shows how prices have changed from 1971 to 1984 for rice and some traditional staples. The price of rice has fallen, while sweet potato and taro prices have risen.

The rising level of rice imports is connected with the successful government policy to expand export crops. Farmers have made money from growing export crops and as labour and land have been transferred from food gardening into cash cropping, so the demand for store foods like rice and tinned fish has risen.

In 1984, over the whole of Papua New Guinea, the average amount of rice eaten was about 33 kg per adult. The situation in urban areas differs from that in rural areas.

Urban areas

The consultants estimated that in urban areas people ate about 80 kg rice per year - a very high quantity which probably will not grow much higher.

People in towns are already used to a high-rice diet, and it would be difficult and unpopular to try to control rice consumption by, for example, raising the price.

Far fewer people in Papua New Guinea live in the towns than in the villages. Thus, the total rice consumption in towns was only about 30% of the national total in 1984.

Non-urban areas

In non-urban areas, the consultants estimated that people ate only about 26 kg rice per year. So here, there is plenty of room for growth in demand. It may be possible to prevent the increasing demand. Ways of doing this include:

Increasing the price of rice by either an import tariff or a tax. This would be unpopular and politically difficult. At the time of writing it seems that the price is set to go down, with the possible import of cheap surplus rice from the U.S.A. This will please consumers, but it will harm the people who produce traditional foods. Their markets must have already been affected as people have switched to eating rice.

Improving the marketing of traditional staples to reduce the price.

- Trying to increase the efficiency in production of traditional staples to reduce the price.
- Trying to develop substitute foods such as processed roots and tubers.

A future FAO study will investigate these choices.

PRODUCTION OF RICE IN PAPUA NEW GUINEA

Many people have said that the obvious way to reduce the growing import bill for rice is to produce rice here in Papua New Guinea.

The FAO team carried out an evaluation of 5 different systems of rice cultivation. That is, they estimated the costs of setting up and operating each system, and compared these costs with the expected revenue from selling the rice.

Table 1 shows the costs and returns (income) for 3 smallholder systems of growing rice. Table 2 shows the costs and returns for 2 commercial (large scale) systems.

According to the consultants only one system could be profitable. This is double cropped rainfed rice. Very limited areas may exist in Papua New Guinea where there is enough rainfall at the right times for double cropping (two crops every year). However a lot of money is needed to set up a commercial rice project. Foreign investors would have to provide this money, and they would no doubt require long term price guarantees from the Papua New Guinea government.

In all the other systems of growing rice, the only way in which farmers could make enough money would be for the government to subsidise the price. That is, the government would have to pay the farmer an amount above the price he would normally

TABLE 1. THREE SYSTEMS OF SMALLHOLDER RICE PRODUCTION

Production system	Capital needed to set up project	Returns for 1 man-day of labour if rice sells at K153/tonne*	Cost of production assuming a minimum wage of K3.50 per day is paid	Percent subsidy needed**
1. Rainfed upland				
a) traditional	Nil	K1.00	K428/tonne	180%
b) improved	K550/20 ha	K2.28	K214/tonne	40%
2. Irrigated semi-mechanised	K6000/20 ha	K3.25	K156/tonne	2%
3. Rainfed - with mechanical services	K9000***	K2.35	K181/tonne	18%

* *K153/tonne is the farm gate equivalent (in Papua New Guinea) of the international rice price, averaged over 1981 to 1985.*

** *The figure given is the percentage of the market price (K153/tonne) which the Government must add to the price for the grower to be able to pay the minimum wage for labour.*

*** *This figure is the cost of purchasing machinery which can service 200 to 400 ha.*

receive at the market. The average world market price over the last 5 years was K153 per tonne. The subsidies needed for each system in Table 1 and 2 are shown as a percentage of this price.

The team especially looked at the possibilities for smallholder production. Unfortunately, returns to labour (the amount of cash earned from the crop compared with the cost of labour) for rice are not very attractive when compared to alternative crops. This is shown in Table 3. Farmers will not choose to produce a crop which does not yield a good income, however much the government tries to persuade them. Again, if the government wants smallholders to grow rice, it will have to pay them a subsidy.

It is not just poor returns to labour that has caused farmers to stop growing rice. It is also the type of labour needed. Rice needs attention every day and for long periods. The work is not very pleasant as the farmer has to spend a lot of time standing in water or mud. The Papua New Guinean farmer prefers low maintenance crops which allow time for many other daily tasks and social activities.

The consultants made the following two suggestions:

1. In areas where there is no alternative cash crop to rice, e.g. around Angoram in the East Sepik Province, the government might consider subsidisation. This would help bring income into a disadvantaged rural community.

2. Rice could be introduced into the garden system as a food crop. This might reduce the labour requirement for the crop as other garden crops would be tended at the same time. If this is to reduce the demand for imported rice from trade stores,

TABLE 2. TWO SYSTEMS OF COMMERCIAL (LARGE SCALE) RICE PRODUCTION

Production system	Capital needed to set up project (investment)	Returns to investment if rice sells at K153/tonne*	Paddy price needed for a 12 per cent return (profit)	Percent subsidy needed**
4. Rainfed mechanised				
a) 200 ha single cropped	K225,000	negative	K225	47%
b) 500 ha single cropped	K394,000	negative	K290	90%
c) 200 ha double cropped	K225,000.	12%	K153	none
5. Irrigated large scale (2000 ha)	K10.9 million	negative	K257	68%

* *See Footnote * in Table 1.*
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farmers would have to change their ideas. They would have to be prepared to grow their own rice. At the moment rice is seen as a cash crop only. The FAO team recommended that D.P.I. research the possibilities of rice as a food crop only. Already some research is underway.

The FAO report does not recommend any particular production system. It simply presents an economic evaluation of the available data, which is summarised in Tables 1, 2 and 3.

TABLE 3. Smallholder returns* per day of family labour, for various crops

Crop		Returns for one man-day of labour
Upland rice:	traditional	K 1.00
	improved	K 2.28
	semi-mechanised	K 2.35
Irrigated rice:		K 3.35
Sweet potato (highlands)		K 2.10 - K 3.10
Maize		K 3.55
Cassava		K 2.00
Rubber (smallholder/ /nucleus estate)		K 1.00 - K 1.40
Coffee, arabica,	average	K 1.30 - K 2.70
	improved	K 4.00 - K 5.20
Cocoa and coconut		K 8.00 - K 9.00

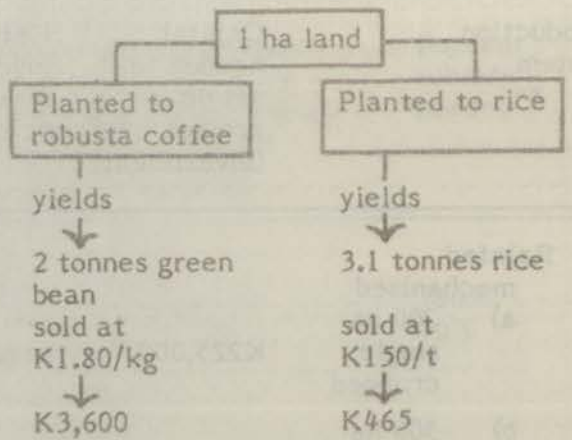
* *Tree crop returns have been averaged over the life of the tree to make them comparable with returns from annual crops.*

If Papua New Guinea decided to produce its own rice, then the appropriate production method world be the one which requires the smallest subsidy per unit of foreign exchange saved. The report shows that this is smallholder rainfed rice, with mechanical services provided. This would require a subsidy of 18% from the Government.

On the other hand, a large-scale irrigated rice project like that proposed for the Mekeo region would need a subsidy of 50% to 70%. It is estimated that a 2000 ha project could produce about 6% of Papua New Guinea's present needs. This would cost the Government K1 million per year in subsidy. Therefore if the whole of Papua New Guinea's rice needs were grown here, it would cost K17.3 million per year in subsidies. The FAO team suggest that this money would be better spent on tree crops.

The following simple example shows why:

Let us take a 1 ha area of land. What are the returns from growing coffee and what are the returns from growinig rice?



Thus by growing robusta coffee, the farmer would receive 7.7 (i.e. 3600/465) times as much money for his crop, than if he grew rice.

Of course, the country must be prepared for a possible fall in revenue from its cash crops. D.P.I. estimated in 1985 that cash crop earnings would rise. We did not foresee the outbreak of coffee rust. The real effects of the disease on the coffee industry are still not known. However the coffee rust outbreak has made us think again about the country's dependence on

imported foods. If the nation earns plenty of foreign exchange then it can afford to import food. If these earnings are reduced, it is not easy to change people's eating habits.

CONCLUSION

The FAO team have produced a report which is intended to help Papua New Guinea in making policy decisions. The report makes only a few recommendations. These are mostly concerned with:

- making substitues for rice more competitive (cheaper or more attractive to buyers)
- research into growing rice as part of the traditional garden system
- monitoring the existing food crops marketing system in order to try to improve it
- expanding food policy research.

It is up to Papua New Guinea to use the information in the report to make wise decisions about rice policy in the future. D.P.I. has known for a long time that rice is not a profitable crop for our farmers. This report includes calculations which show just how much a rice production programme could cost. It seems that the wisest course is to reject rice production.

However, we must try to reduce the rate of growth of rice demand; probably the only way this can be done is through the efficient production and marketing of traditional staple foods. Taxes or import quotas on rice will not be acceptable, but if traditional staples can be made cheaper, then there is hope that people will eat them more.

FURTHER READING

FAO (1986). Rice development policy. An analysis of the options for meeting future rice requirements. FAO: Rome.

Author's Note

Since this article was submitted inter-national prices for coffee have fallen considerably. Farm gate prices for robusta are now about K1.00/kg. This means that, in the example given in the article, revenue from 1 ha of coffee would be some K2,000. The coffee producer's comparative advantage over the rice producer has therefore now fallen to just over 4:1. In a sense the argument is reinforced. Despite a 44 per cent fall in the farm gate price of coffee the coffee producer is still markedly better off than the rice producer.

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