IMPROVING FOOD PRODUCTION AND PEOPLE'S NUTRITION

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INTRODUCTION

Papua New Guinea faces some serious food problems. In most provinces, the Division of Primary Industry extension staff and other people want to do something about these problems, but they are often not sure what to do. The main thing that didimen and didimeris do to improve food production is to multiply seed and planting material, hand this out, and plant demonstration gardens. Are these the best things to do?

I think that extension should be about changing people's beliefs and the way they look at things, as well as about providing services, and teaching people about new agricultural techniques or crops.

In this article I want to talk about some things that extension officers could be doing to improve food production in Papua New Guinea and to improve people's nutrition.

Like many children in Papua New Guinea, this little girl who lives in Oro Province is malnourished. If village people see this as a problem as outsiders do they may be able to solve the problem themselves. Extension is about changing attitudes, not giving out planting material.

THE PROBLEMS

These are the food and nutrition problems that Papua New Guinea faces:

1. A lot of children and even adults are malnourished. The 1978 National Nutrition Survey found that 38% of young children in Papua New Guinea were malnourished. This survey covered about one quarter of the nation's children who were less than 5 years old. It was done in all provinces and most districts.

2. A lot of food is being imported. The Government estimates that about one quarter of the food eaten by nationals is imported. Food imports are rising very fast.

Food imports cost Papua New Guinea about K130 million a year (drinks and tobacco add another K6 million to this). This is about one fifth of all imports. In 1981 the value of all the export crops together (coffee, cocoa, copra oil, etc.) was K168 million. This is not expected to increase much for many years. This means that at times of low prices for export crops, which we have at present, most of Papua New Guinea's export crops are just paying for imported food!

3. The population is rising quickly. Pressure on good agricultural land is increasing because of cash cropping, population increases and movement of people towards roads. In some parts of the country there are already too many people for land to support them properly; e.g. the Nembi Plateau in the Southern Highlands; the Wosera area near Maprik. In other parts of Papua New Guinea this could become the situation before long; e.g. in the Gumine area of Simbu Province.

4. Local food supplies for many of our urban areas and institutions are not adequate. People depend on imported food. Locally produced food is often very expensive. There are many reasons for this:

. Papua New Guinea does not have any traditional grain crop, and all the traditional staple foods are bulky, will not keep for long after they are harvested, and are easily damaged in transport. Because people are used to harvesting food and eating it straight away, they do not understand that much more care has to be taken in harvesting at the right time, sorting, rejecting damaged or diseased produce, handling and packing, if fresh food is to get to market in good condition.

. The coastal climate is hot and humid and fresh food goes rotten quickly.

. Some areas where food grows well do not have good roads to towns, so transport costs are high.

. People are not familiar with large scale methods of production and distribution which are needed to distribute local foods cheaply to people in towns.

THE NUTRITIONAL PROBLEM

The following are the nutritional problems of <u>rural Papua New Guineans</u>:

1. <u>Protein-energy malnutrition</u>. Nutrition research workers are still not certain whether protein or energy (calorie) deficiency is the main nutritional problem in Papua New Guinea. At the moment it seems that protein deficiency is more serious, especially in the highlands. However, there are some parts of the country where people do not get enough energy food to eat.

2. <u>Iron deficiency</u>. This is common, especially in pregnant women and children in the lowlands. Shortage of iron in people's diets is made worse by malaria infestation.

3. <u>Iodine deficiency</u>. This occurs in some mountainous parts of Papua New Guinea. The use of iodised salt and iodine injections in oil have greatly reduced this problem.

There is very little evidence of vitamin deficiency amongst rural Papua New Guineans who eat a traditional diet. Beriberi (vitamin B1 deficiency) has occurred among people who eat a rice based diet. Vitamin C deficiency has been recorded amongst prisoners in jails who

are not given any fruit or vegetables to eat.

It should be noted that possible nutritional problems amongst urban dwellers are likely to be very different from those of village people. Urban dwellers are likely to be more susceptible to vitamin deficiencies and overeating, especially of food rich in fats and sugar.

LIFESTYLE AND THE ENVIRONMENT

The Papua New Guinea Food and Nutrition Policy shows that the Government is worried about food and nutrition problems. The Policy states that more food must be grown by both subsistence and commercial food producers to reduce food imports and to reduce malnutrition. There are many things that extension officers can do to assist with food production. Before an officer can help other people with food and nutrition, he or she must consider his or her own lifestyle and understanding of local environment.

Lifestyle

The lifestyle (way a person lives) of an extension officer is important. Extension officers can encourage people to grow food for their own use and to sell, and to eat nutritious food. However, people believe what you do, not what you say. So if extension officers want to have an influence in a community, it is very important that they and their families eat nutritious food themselves. They should eat locally grown food if possible, not imported food. Also, they should grow at least some of their own food - even if it is only in a small vegetable garden.

Extension officers should realize that their lifestyle will be observed very closely. Every meal of the outsider that includes locally grown foods shows the village people that these are valuable foods. Every meal that does not include locally grown foods suggests to the villagers that their own foods are of inferior value.

Understanding the environment

The environment includes the physical and the social environment. The physical environment includes altitude, rainfall and soil type. The social environment covers people's customs and beliefs, where they live and produce food. It is very important that extension officers have a good understanding of both the physical and social environment before they attempt to make any changes. Otherwise they could make bad mistakes and their suggestions are less likely to work.

The best way to understand how people live and their social customs is to spend time in villages. Agriculturalists can learn a lot by talking to people and visiting their gardens.

By doing formal and informal surveys of food markets you can get information on seasonality of food supplies and shortages.

Altitude and rainfall are two important aspects of the physical environment that agriculturalists must understand. Altitude is very important in the highlands, but it can also be important in non-coastal locations everywhere. For example coconuts grow and bear up to an altitude of about 1000 m in Papua New Guinea, but they grow best below 500 m. Oranges and mandarins bear up to 1800 m, but they give the best quality fruit between 800 and 1400 m.

Doing a garden survey in the highlands. Visiting gardens, talking to people and doing surveys is a good way to find out about local agriculture and the local environment.

Information on altitudes can be obtained from 1:100,000 topographic maps. These are available from the National Mapping Bureau, P.O. Wards Strip. Maps cost K2 to Government Departments or K3 to individuals.

Information on rainfall can be obtained from the book by McAlpine and others (1975). This can be obtained free from:

Division of Land and Water Resources, C.S.I.R.O., P.O. Box 1666, Canberra, A.C.T. 2600, AUSTRALIA.

Building on traditional agriculture

Papua New Guinea villagers know a lot about agriculture in their area. They also understand their local environment very well. It is important to understand the knowledge and traditions of villagers, and to build on them. We should be working within the existing agricultural system, not changing it completely. The use of mixed cropping as distinct from monocropping is a good example of this. A didiman or didimeri may wish to introduce a new crop (e.g. pigeon pea) into an area. Instead of planting a pure stand of pigeon pea in a special garden, the crop should be incorporated into the existing system. It could be planted in the mixed vegetable or household garden if this is how people plant their vegetable crops.

In this garden different types of yams are mixed cropped with taro, bananas, aibika, corn, beans and other crops. Mixed cropping is more efficient than monocropping. We should be building on Papua New Guinea food and gardening traditions, not replacing them.

WHAT CAN EXTENSION OFFICERS DO?

Talking with people

As outsiders, we see malnutrition or food production differently from village people. We see malnutrition as a problem because it means people have a greater chance of becoming ill and dying and it may reduce their ability to learn. Village people may not be aware of these things, and thus not see malnutrition as a problem. Unless people see it as a problem, there is no point in handing out peanut seed or suggesting ways for people to grow more food. It is more important that they see the problem themselves. Often they have the ability to change things in their lives if they see it as necessary.

This means that it is important to talk to people about these things. Some of the issues that could be discussed are:

1. Child malnutrition and illness and their causes.

2. Food traditions. The value of traditional foods, varieties and customs. Does it matter if they are replaced by store foods?

3. Land use. Which is the wisest use of people's land? Are cash crops using land that should be used to produce food?

4. Food shortages and seasonality of food supply, and how to solve these problems.

5. Responsibilities of men and women. Who is responsible for food and nutrition? Is it the women only or is it men and women.

6. How much food to sell in the market and how much to keep for the household to eat.

7. The importance of making large food gardens.

Nutrition messages

There are a number of standard nutrition messages. These should be promoted as widely as possible. Extension officers must practise them themselves. Here are some of the messages the Department of Health teaches:

1. Start feeding children solid food when they are 4 to 6 months old.

2. Breastfeed children until they are 2 years old.

3. Adults and children must eat a mixture of different foods. This includes energy foods such as sweet potato, taro or rice; body building foods such as peanut and tinned fish; and protective food such as fruit and vegetables).

4. Add grease to every meal, such as dripping or pig meat.

5. Eat beans, peanuts and other body building food every day.

6. Eat three meals a day, plus snacks. This is important for small children.

7. Pregnant and breastfeeding women must eat plenty of mixed foods, especially extra body building food.

Land use

Land use simply means how land is used. Land use patterns are changing with cash cropping, movement of people and changes in staple food crops. It is important that land is used wisely. People must keep enough good land for food gardens. Sometimes the best land, or land nearest the village, is used for cash crops and there

is not enough land for food production. On the Gazelle Peninsula of New Britain and on Karkar Island, most land near the villages has been planted to cocoa and coconuts and people must walk or drive a long way to their food gardens. Many traditional foods are no longer grown and people are dependent on the market and stores for their food.

Timber is in short supply in much of the highlands. This means that people have to walk a long way to get timber for firewood, fencing and house building. People should be encouraged to plant casuarinas ('yar') and other trees near hamlets in the highlands.

Cattle need a lot of land. They may use land that is needed for food gardens and fallows. Cattle should not be encouraged in areas where there are a lot of people and land is scarce. Many cattle projects in Papua New Guinea have too many cattle for the area fenced. This means that the cattle do not grow properly; the vegetation is destroyed and the soil is eroded; and the cattle break out of the fences and eat people's gardens. Cattle damage many food gardens on the Sepik plains. In Oro Province, many cattle have escaped from cattle projects because they are hungry. These cattle are a direct cause of human malnutrition because they eat people's taro gardens.

Pigs can also do a lot of damage to food gardens. Pig damage is one of the main causes of food shortages in the highlands. Gardens need to have strong fences in places where pig damage is likely.

Intercropping of food crops with export tree crops is a good land use pattern. It is sensible to plant food crops with young cocoa, coconuts, coffee, rubber and oil palms. Food crops, especially Chinese taro, can be planted under mature coconuts as well if the coconuts are not growing too closely together.

Improving soil fertility

In some situations it is useful to improve the soil fertility for gardening. This is not the case where gardens follow a long forest fallow. It is often useful where land is scarce or the soil poor. This usually applies to institutional farmers, such as schools or corrective services institutions. These are some of the things that can be done to improve soil fertility:

1. Use coffee pulp or cocoa pods as fertilizers. Both coffee pulp and cocoa pods have been shown to increase the yield of sweet potato. (See article by Siki, 1980.) The recommended rate is 30 t/ha. This is the same as 3 kg/m^2.

2. Use organic wastes. Food scraps from the kitchen and weeds from gardens can be used to fertilize gardens rather than wasting them. Village people often burn or throw away organic wastes that could be used to improve crop yields. They can be used to make a compost heap; or used to make compost directly in sweet potato mounds; or thrown in a pile at the base of banana and fruit trees. Compost heaps are likely to be most useful to institutional farmers rather than village farmers. For more information see the articles by Bourke (1982), D'Souza and Bourke (1982) and Leng (1982).

3. Use animal manure. Manure from pigs, cattle, sheep and chickens makes very good fertilizer for most crops. A general recommendation is to apply animal manure at 15 t/ha (1.5 kg/m^2). See the article by

In this demonstration, the corn on the left received pig manure, the corn on the right was a control plot. The pig manure gave a large increase in yield. Demonstration plots like this can be an effective extension method.

Planted casuarina fallows are used in the Elimbari area of Simbu Province. Planted tree fallows are appropriate in some situations to improve soil fertility and provide timber.

Kimber (1982) for information on pig manure.

4. Casuarina fallows. In parts of the highlands, people who are short of land use casuarina fallows to improve soil fertility. Casuarina trees can grow very quickly and improve soil fertility because they are able to get nitrogen from the air. This seems to be a useful technique for hilly country where the fallow period would be at least 10 years long. Extension officers can assist people by showing them how to make casuarina nurseries.

5. Crop rotation. The use of crop rotation is another way which helps maintain the fertility of gardens. Crop rotation can also help to reduce pest and disease problems. Some people in Papua New Guinea already practise crop rotation. A rotation of peanuts with sweet potato is common in the Eastern and Western Highlands, the Gazelle Peninsula and in other places.

6. Mixed cropping. This means that different species and varieties of crops are all planted together in a mixed pattern. This is the traditional technique in Papua New Guinea. It is usually much more efficient than monocropping (planting one species of crop only in a garden). Mixed cropping reduces weeding and gives greater yields. This is because the ground is covered more fully, and sunlight and plant nutrients are used efficiently. Many people think that it is better to follow the western idea of monocropping. This is a good system where machinery is used to harvest crops or where many hectares of crop are planted together. In most situations in Papua New Guinea, however, mixed cropping should be encouraged as much as possible as it is the most suitable system.

Promoting valuable crops

Whenever extension officers have the opportunity, they

should be promoting the use of certain useful crops. This can be done in formal and informal situations. The best way to promote a crop is probably to grow and eat it yourself.

A crop is valuable if it gives nutritious food; is easy to grow in a certain area; or can be sold for cash. Some crops, such as spring onions, are useful as a flavouring for food because they can make it more interesting to eat. Vegetatively propagated crops are often more useful in Papua New Guinea than seed propagated crops. Perennial crops are also useful because they do not need a lot of work to maintain them. Also they can grow in one place for many years without exhausting the soil. A list of some valuable crops in Papua New Guinea is give in Table 1.

Planting material

A lot of effort has been put into propagation and distribution of planting material. This can be a useful thing to do. We need to ask: Is it useful to distribute a certain crop? There is no point in distributing things that people already have, such as aibika, pitpit or rungia, unless you have an improved variety to offer. It is more important to convince people to grow and eat more of these foods. On the other hand, it is often difficult for institutions to obtain local greens and it is useful to distribute planting material of greens to them.

Outsiders are often keen to introduce new crops to an area. Useful crops such as pawpaw, pineapple, peanuts, corn and Chinese taro are now present in most parts of Papua New Guinea. Many other introductions such as soyabean or rice, will certainly not be accepted in the long term. Other crops, such as tomato, may be accepted but they will add little to people's diets.

To have a significant effect, a large area has to be planted to multiply seed or cuttings for distribution. When planting material is distributed, extension staff need to emphasize that people must keep some of the crop for replanting. This is especially so for seed propagated crops like peanuts. People should be shown how to store seed in airtight bottles or tins. (For more details about saving and storing seeds, see the articles on pages 1 to 10 of this issue of HARVEST.)

TABLE 1. VALUABLE CROPS THAT SHOULD BE PROMOTED IN PAPUA NEW GUINEA

Vegetables (Protective foods)	Nut crops (Body building foods)	Other high protein foods	Energy foods	Fruit (Protective foods)
Aibika	Breadfruit	Broad bean	Bananas	Avocado
Amaranthus	Candle nut	Cowpea	Corn	Bananas
Kangkong	Coconuts	Lima bean	Potato	Citrus
Kumu musong	Galip	Peanuts	Sago	Guava
Oenanthe	Karuka	Pigeon pea	Sweet potato	Mango
Pumpkim	Pao	Winged bean	Taro	Marita
Rungia	Okari	Yardlong bean	Yams	Pawpaw
Tulip	Tulip	(snake bean)		Pineapple

The following crops could be propagated for distribution in each province:

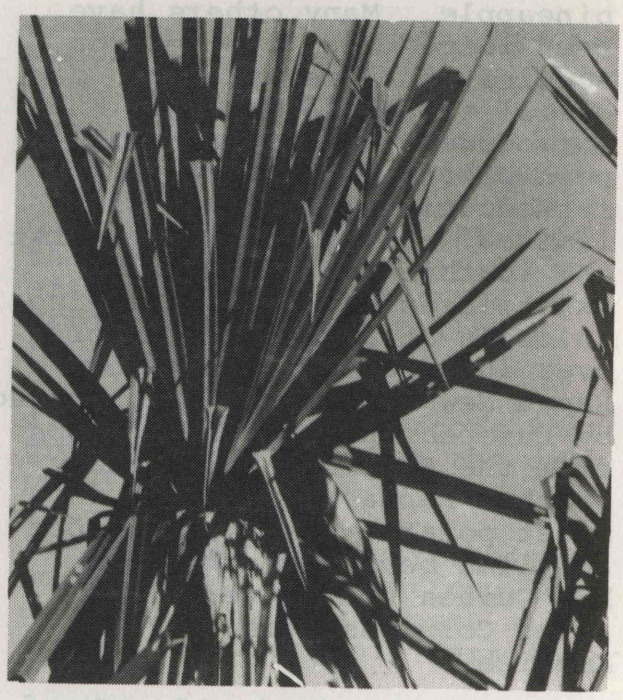
Lowlands. Peanuts, corn, winged bean, yardlong bean and hybrid coconuts. Also, the following could be grown for distribution to institutions and urban dwellers: aibika, aupa (amaranthus), pitpit, pumpkin, cowpeas, kangkong (kango), kalaua *(Omocarpum orientale)*, sugarcane, mango, avocado, guava, five corner, pineapple, eating bananas, galip, okari, tulip, breadfruit, pao nuts and pawpaw.

Highlands (1200-1800 m a.s.l.). These are crops that could be distributed to villagers: peanuts, corn, winged bean, common bean, potato and casuarina. The following could be grown for distribution to institutions and urban dwellers: Rungia, amaranthus, oenanthe, pumpkin, kumu musong *(Ficus copiosa)*, watercress, pineapple, sugarcane, avocado, guava, tree tomato and passionfruit.

High altitude (over 1800 m a.s.l.). The following could be grown for distribution to villagers: corn, potatoes, broad beans, common bean, pea, casuarina, pumpkin and karuka.

Supplying planting material of improved varieties of locally important crops is one of the most useful things that an outsider can do to help people.

Planting material of improved varieties can usually be obtained from research stations. Corn and sweet potato are available from Aiyura, Keravat and Laloki. Planting material of unselected varieties of many other crops is also available. (For further information see Aiyura Technical Bulletin No.16: L.A.E.S.; Keravat Information Bulletin No.13; and Laloki Information Bulletin No.3)



'Karuka' trees that grow at about 1800 metres altitude give a nut that is high in protein and energy. Valuable crops like this should be promoted in every way possible.

Introductions from overseas

Bringing in new crops and varieties from overseas is a popular activity amongst many expatriates, didimen and other educated Papua New Guineans. Unfortunately it is very easy to bring seed or planting material into Papua New Guinea in the post or through quarantine at the airport. Very many introductions are made illegally every year. They are not made by ordinary village people and urban dwellers! Is it worthwhile to do this? Let us look at the facts.

Hundreds of introductions of food crops have been made into Papua New Guinea over the past 100 years (this becomes thousands if you count weeds and ornaments). Many of these crops have been important to people. These include coffee, cocoa, chinese taro *(Xanthosoma)*,

peanuts, pak choi, corn and pineapple. Many others have been lost. Most of the crop species that are likely to be useful to people have now been introduced. There are some possibilities for further introductions, but they are limited. You are not the first one to think of a new crop. Expatriates have been bringing in crops at a great rate for over 100 years. Even before Papua New Guinea was 'discovered' by European people, some crops from the Americas had already reached Papua New Guinea. Sweet potato, cassava, tobacco and lima bean were in Papua New Guinea not so very long after Columbus 'discovered' America.

Often new varieties are not useful. Virtually all corn varieties for the subtropics or temperate areas do not grow well under Papua New Guinea conditions.

Even if a new variety is successful, it is likely to be lost unless it is maintained on a research station or is available from commercial sources.

The chances of introducing pest, disease and weed problems into Papua New Guinea are very great. Papua New Guinea is still relatively free of many major pest and disease problems of our major food and export crops. The results could be disastrous if coffee rust, cassava bacterial blight, bunchy top on bananas or witches' broom on cocoa or many other diseases came into Papua New Guinea.

Remember that insect pests and diseases of one crop can be carried on another crop. Your little introduction of an ornamental plant or some vegetable seed could bring in a very serious pest of sweet potato or coffee.

Uncontrolled plant and seed introductions are not likely to do much good for the people of Papua New Guinea. There is a good chance that some of them will do a lot of harm. Crops and varieties can be introduced through proper quarantine channels. DON'T INTRODUCE PLANTS AND SEEDS INTO PAPUA NEW GUINEA YOURSELF!

Making things available

There are some supplies that village people have difficulty in obtaining. Many people do not live near the large towns where these things can be bought. Even if they do, the supplies are often sold in too large quantities to be useful. These are some things that village people often want to buy and that didimen and didimeris could help them with:

1. Tools such as spades and hoes. Village Equipment Supplies sell tools and other agricultural needs. Write to them at P.O. Box 2171, LAE, for a catalogue.

2. Pig wormer. This helps pigs to grow better and use food more efficiently. Nilverm granules are not expensive and village people are often keen to buy it. A small scoopful should be given to the pig for each 9 kg of body weight. So a 45 kg pig would be given 5 scoops. It should be given once a year to large pigs and once a month to pigs younger than 6 months old.

3. Chickens and ducks. Chickens and ducks are popular with village people. They can be a good way to help people eat more protein, although they are not successful everywhere. Supplying day old chickens and ducklings can help people. Otherwise didimen can raise the chickens or ducklings until they are 4 to 6 weeks and then sell them. Chicken food is often difficult for people to

obtain and they appreciate assistance with this.

4. Carp fingerlings. Carp are suited to the highlands. Fingerlings can be obtained from Aiyura for distribution to village projects. The advantage of carp is that they will grow even if they are not fed food. In Asia, grass is thrown into ponds for the fish to eat and mud from the ponds is used to fertilize gardens nearby.

5. Chemicals. People sometimes want to buy chemicals. Often they are not really useful on a long term basis, but sometimes they are. Cabbage dust is a common request in the highlands. It is cheap, usually effective and safe. Boron fertilizer can be useful in establishing causarina or pine plantations when it is applied in small quantities (10-20 kg borax per hectare or 5 g of borax per seedling).

These are only some of the needs that village people have. Obviously the needs will vary greatly in different places. A commercial pineapple grower might want flowering hormone or a coastal villager might want assistance with an outboard motor. It is often possible for didimen to help transport food to town for sale. Sending money to buy goods by mail order is often a problem for villagers. A didiman's personal cheque can solve this. By providing small services such as these, extension officers can help people and gain their respect. This can be a useful way to obtain people's confidence before talking about malnutrition, land use and other important issues.

Demonstration gardens

Demonstration gardens have become popular among agriculturalists and nutritionists in recent years as a method of promoting good nutrition. Most demonstration gardens are not very good at doing this. The most effective demonstration garden is the one in your own garden that provides the food that your family eats. To be effective a demonstration garden must do the following things:

1. Grow nutritious foods that grow well in the area and are popular.

2. Use appropriate techniques such as hand cultivation, locally used fallow types, mixed cropping and organic fertilizer.

3. Provide food all year round.

4. Be large enough to support a family with nutritious food.

Unless a demonstration garden is doing all of these things, it is most likely a waste of time. Demonstration gardens could be useful for a special purpose, such as demonstrating the effect of pig manure. These should be planted in existing food gardens, not in special separate gardens. But I do not think that planting a small plot of peanuts, soyabeans and spring onions really achieves anything.

What about cash cropping?

Is there a conflict between cash cropping and food production? Sometimes there can be. Land may be used for growing export crops or food for sale that would best be used for subsistence food production. Nutritious foods such as peanuts or yams may be sold, that hungry children should be given to eat.

However cash cropping provides cash for people. This can be used to buy useful things and luxuries, such as tinned fish,

saucepans, clothes or radios. It also gives men a reason to stay in their village. In remote parts of Papua New Guinea where there is little cash cropping, it should be encouraged as a way of helping people obtain money and of keeping men in the village.

At the same time people should be aware of conflicts that could arise between cash cropping and subsistence food production. This is outlined under 'Land use' on page 15 of this article.

Is it appropriate?

It is important to consider the needs of the people you are working with. People's needs vary greatly between different locations in Papua New Guinea. The things that can be done to help a coastal New Ireland villager will be quite different from things to help a villager in a remote inland place in Gulf Province. The needs of subsistence, institution, commercial or urban food producers and consumers will be very different. Here are a few of the differences that an extension officer must consider:

Institution farmers. An important need will be to grow or buy protective foods such as green vegetables. Institutional farmers often want help with obtaining planting material of usually common crops, in planning land use and crop rotations. They need encouragement to plant traditional foods (if they are appropriate) and perennials.

Urban people. Again protective foods such as vegetables and fruits might be short in urban people's diets. They need help with composting, planting material and fruit trees.

Commercial farmers. This group needs help with obtaining different types of planting material (such as introduced vegetables or potato seed), and with marketing.

The didimen and didimeris must consider the needs of the group they are trying to help. There is very little evidence that village people in Papua New Guinea are short of vitamins in their diet. Therefore it is not so important to encourage village people to plant more fruit trees, except for high energy fruit such as banana, avocado and 'marita' pandanus. On the other hand, vitamins could possibly be short in the diet of a person in an institution ('kalabus', school or hospital) or living in an urban area. For these people, pawpaws, guava and mandarins may be very appropriate.

CONCLUSIONS

Papua New Guinea is facing some serious food problems. Child malnutrition is common; a lot of food is being imported and this is costing the country a lot of money; land pressure is increasing; and food supplies for many of our urban areas are often not adequate. There is a lot that didimen, didimeris, nutritionists and others can do to help people grow more and to eat better. But firstly the extension officer must be living an appropriate lifestyle him- or herself. He or she must also have a good understanding of the local environment and must think about the real needs of the people he or she wishes to help.

The best way to help people may not necessarily be to hand out planting material or plant a small 'demonstration garden'. Teaching people new techniques, such as how to establish a casuarina nursery or using coffee pulp for fertilizer is import-

ant. New varieties of imported foods or new crops can also be useful. Providing services, such as helping people buy chickens or tools, can also be a good way to help people.

But something that is just as important is changing people's attitudes, helping them to see problems and to find solutions to these themselves. Village people in Papua New Guinea have much knowledge about their local environment and how to survive in it. If they see a problem, they often have the ability to change things or find a solution.

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