South Pacific

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The subsistence sector in Pacific island countries

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This paper is a revised version of the final item in a large research program undertaken by the writer and a team of consultants in collaboration with the Economics Division of the Pacific Forum Secretariat. The program was commenced in early 1990 and completed in 1992.

The program covered five Forum island countries—Solomon Islands, Tuvalu, Kiribati, Western Samoa and the Federated States of Micronesia. Detailed reports on the subsistence sector in each country was submitted to the Forum Secretariat to be made available as a reference for researchers concerned with the subsistence sector in the island countries. The country reports were undertaken by George Kirau (Solomon Islands), E.K. Fisk (Tuvalu), Marion Ward (Kiribati), R. G. Ward (Western Samoa) and John Connell (Federated States of Micronesia).

The individual country reports are the result of years of work in the Pacific supplemented by a substantial period of fieldwork for the specific purposes of this research program. Researchers are encouraged to consult the individual country reports and associated data. These are available in the archives of the Forum Secretariat.
The main findings of individual country reports on the subsistence sector in the Pacific island countries of Solomon Islands, Tuvalu, Kiribati, Western Samoa and the Federated States of Micronesia are reviewed here and an attempt has been made to indicate some of their more important implications. The need for some new directions in Pacific island policies is suggested, with emphasis on developing the advantages available within the island countries and their cultures, and less on attempting to follow the paths of countries whose backgrounds, situations and ethos are different from, and not entirely applicable to, Pacific island situations. In particular, the suggestions are confined to aims that are attainable and practicable.
The subsistence sector is that part of an economy in which economic activity is not monetised. Strictly speaking, the subsistence sector can no longer be considered purely as a group of people, nor as a set of specific areas in a country, because nearly all groups of people, right down to individual families, now use money for at least some of their needs, and there are now very few areas in which some monetary exchange does not take place.

Technically it would be preferable to use the term ‘non-monetary economic activity’ to describe the production, consumption and transfer of goods and services outside the monetary system. However, the terms ‘subsistence sector’ and ‘subsistence production’, are in common use around the Pacific, and are important concepts for economic and social planning. It would be pedantic not to use them. It is necessary, however, to define them in order that they may be understood in a clear and precise sense. Subsistence or non-monetary production, taken literally, would include the growing of a pot of herbs in the kitchen window.

For purposes of this paper, therefore, the subsistence sector is defined as that part of the economy where the people produce, for their own consumption, most or a large part of their basic needs. This is necessarily a fairly rough definition, but it is a starting point.

Size and importance of the subsistence sector

The subsistence sector in the five countries discussed here (Solomon Islands, Tuvalu, Kiribati, Western Samoa and the Federated States of Micronesia) is still of great economic, social and political importance. Apart from anything else, it provides all or a major part of the basic needs for the great majority of the people.
In Solomon Islands about 12 per cent of the economically active population relied wholly or mainly on monetary activities for their living in 1986, with the remaining 88 per cent probably all in the subsistence sector.

In Western Samoa in 1986, 59.3 per cent of the economically active population aged 15 and over, had been working primarily to grow, gather or catch food to eat. That proportion had increased from 53 per cent in the previous census, five years earlier. Moreover, the remainder of the economically engaged population, classified as ‘working primarily to earn money’, would have included many daily or weekly commuters who still obtained a significant proportion of their basic needs from their home villages and gardens, so the importance of the subsistence sector was likely to be greater than the census figures would suggest.

In Kiribati, the proportion of the population relying wholly or largely on subsistence for their basic needs was about 80 per cent and in Tuvalu about 75 per cent.

For the Federated States of Micronesia, data of persons or households working primarily for money, or primarily for subsistence were not available. However, about 25 per cent of employment was in government, 14 per cent in trade and other services, 7 per cent in construction, and 6 per cent in industry and handicraft. This leaves 48 per cent in agriculture and fisheries. As the economy of the Federated States of Micronesia is heavily dependent on government expenditure, which in turn provides the mainstay of trade, services, and what little construction and industry there is, nearly all those engaged in agriculture and fisheries, and a proportion of those engaged in a small way in trade and handicraft production, as well as some people unable to work, would rely heavily on subsistence sector production for most of their basic needs. It would seem reasonable to estimate that about 50 per cent of the population probably still relied on the subsistence sector for most of their basic needs. It would seem reasonable to estimate that about 50 per cent of the population probably still relied on the subsistence sector for most of their basic needs. As government expenditure was almost the only force behind the monetised sector in the Federated States of Micronesia, and as government funding was so heavily dependent on the reducing US grants under the Compact of Free Association, it is not clear how the existing pattern of dependence on imported foods can be sustained.

The subsistence sector is the mainstay of the economies of the five countries discussed in the report, with the majority of the population obtaining most of their basic needs from this sector. It is also, in its mixed mode, the main source of agricultural exports in each country, except Western Samoa.

Although the subsistence sector is still the source of a large part of basic needs in Pacific island countries, it is now supplemented by a range of market goods and services for which money is required. The subsistence sector is now almost everywhere a mixed cash/subsistence sector, and pure subsistence households are extremely rare.

This mixed subsistence plus cash mode of production and living has many advantages. A household provided adequately with its basic needs of food and shelter
from its own non-monetary production can achieve a considerable increase in welfare and satisfaction from quite a modest supplementary cash income, which enables the purchase of convenience and luxury goods that they cannot produce for themselves. Moreover, provided they can maintain their subsistence production at an adequate level, they are to a great extent insulated from the worst effects of exogenous variations in world economic conditions, increasing their purchases of non-essentials when cash incomes are high, and reducing them, without facing serious deprivation, when cash incomes are low. This also applies to a proportion of wage and salary earners, so long as they retain the right to return to their village of origin and re-enter subsistence production when the market for wage labour is depressed.

This mode of living has served the island populations well in the past, and still provides them with a higher level of living than a large proportion of the world’s population. Abject poverty is a rare phenomenon in any of these countries, and even in the depressed state of the world economy in the early 1990s this remained true. It is the continued existence of the large and viable subsistence sector that makes this possible.

Structure of the subsistence sector

The subsistence sectors in the Forum island countries are by no means homogeneous. This is partly due to variations in resource endowment whereby the range and quantity of subsistence products that can be obtained with a given work effort are greater in Solomon Islands, Western Samoa and the high islands of the Federated States of Micronesia than in Tuvalu, Kiribati and the outer atolls of the Federated States of Micronesia. In addition, the subsistence sector throughout the Pacific has been modified to varying degrees by the intrusion of monetised economic activity.

In the Pacific generally, and especially in the five countries covered in this report, the proportion of the indigenous population specialising in monetary activities, to the extent that the breadwinners and their families do not rely on self-subsistent production for any significant proportion of their basic needs, is very small. Nevertheless there is much variation between countries in the degree of participation in the monetary sector. It is in this degree of differentiation, and the proportion of the population involved in each degree, that the main differences lie, and in which the greatest changes are taking place.

The changes, moreover, are not always in the same direction. In many Forum island countries, and particularly in Solomon Islands and Western Samoa, participation in the monetary sector decreased in two or three recent years, in response to the decline in commodity prices and in the general level of world economic activity. Indeed, it is one of the greatest merits of the subsistence production system that it enables this retrogression to take place relatively painlessly when external economic conditions are unfavourable.
Monetisation

A mixed mode of subsistence/cash living can bring great advantages to the subsistence household. It gives access to a range of market goods that cannot be produced by the household. Some of these goods, such as metal implements and tools, bicycles and hand carts, and improved fishing gear are production goods and by reducing the effort cost of their production enable them to produce more per unit of labour. Other goods such as kerosene lamps and stoves, electric torches and mosquito nets improve the convenience of their living. This applies also to convenience foods such as rice, flour and tinned goods which are easier to store and prepare than many traditional foods, but these, like tobacco, alcohol and sugar, can be disadvantageous to the economy and health of the nation when used to excess.

Generally, however, where subsistence production can be supplemented by a cash income, this is a gain, and there is no doubt that it is something that most subsistence producers strongly wish for. The degree of monetisation varies widely within countries as well as between them. It has been a development that is keenly sought by the rural people of the Forum island countries, and eagerly fostered by their governments.

The five main ways in which this monetisation has been achieved are

- working for wages and salaries (for example, from government, plantations, and commercial, industrial and financial activities in the private sector)
- cash cropping for export (such as copra, coffee, vanilla, cocoa) or for local sale (usually vegetables or fish)
- pensions, interest, etc.
- remittances, usually from relatives in wage or salary jobs
- small businesses, such as village shops, handicraft manufacture, trades, transport.

The overall setting

Forum island countries have certain disadvantages deriving from their size, location and geography. These disadvantages are partly internal, and partly external. The external disadvantages are mainly a result of being small operators in world markets, both as producers and as consumers. They are in most cases remote from the main markets of the world and awkwardly positioned away from the main trade routes, although climatically and agriculturally they have much in common with other much larger and more favourably situated countries in the humid tropics. There is little they can produce that cannot equally well be produced on a larger scale elsewhere. As a result, in their international dealings they are at a comparative disadvantage both as
producers and consumers. Their internal disadvantages lie particularly in the fields of transport, and in the organisation, collection, storage and assembly of their products.

All this means that Pacific island producers generally get a low price for what they sell on world markets, and pay a high price for what they buy with the proceeds. This is exacerbated by the low level of marketing infrastructure, and in some cases, by a low level of experience and skills.

These difficulties also apply to industrial production, and although there have been some modest successes in this field, these have been based mainly on low wage rates and preferential entry to specific foreign markets. What can be done in this way is quite limited, at least in the short term. It is difficult to see the small Pacific island countries overcoming the disadvantages of small scale and remoteness to the extent that they become significant industrial economies in the near future. What seems practicable should indeed be attempted, provided it is clear that the benefits, socially as well as economically, exceed the costs in the long term.

Economic development as it is understood in industrialised countries is dependent upon monetisation. The processes that most effectively expand industrial capacity all involve specialisation, division of labour and the accumulation and use of sophisticated forms of capital. These in turn are only possible within a monetised framework. Monetisation is thus a necessary precursor for economic growth. But where the scope for growth is limited by other factors, caution is needed. In particular, where the majority of the people obtain most of their basic needs from the subsistence economy, care must be taken not to destroy the subsistence economy until something better is available on an adequate scale to take its place. There are clear signs that this destruction of the subsistence base is already beginning in some areas, and where it is, the lessons should be studied and a better way found.

The concentration of government planning and attention on the development of a monetised economy based on international trade is understandable and correct up to this point. But to attempt to continue the process where the conditions of isolation, dispersal, remoteness and small scale make this economically unfeasible, is neither advisable nor necessary.

Problems

An export-oriented policy based on rapid and widespread monetisation may have been reasonable enough as a starting point for development, but in some areas it is being pushed too far and in recent years some problems have arisen.
World commodity prices have been unstable and falling. This is particularly so for the main cash crop of the Forum island countries, copra. In several years recently the price has been so low that many small producers have not found it worth the effort to continue production.

New planting of coconuts has frequently taken place on the best land, taking it out of traditional production for garden produce. This has relegated food gardens to less fertile or more distant land, and in some cases has reduced the fallow period and productivity of food gardens has declined.

In areas of high population pressure on land resources, such as North Malaita in Solomon Islands, the long term effects of the above processes are leading to degradation of the land.

Planting of tree cash crops has been undertaken in some cases as a means of claiming long term ownership of the land. This takes the land out of the normal cultivation/fallow cycle even where the tree crops are not productive, or very poorly productive.

In Tuvalu, some areas newly planted or replanted with 'improved' varieties of coconut palms have been unsuccessful.

The coconut palm plays a very important part in the subsistence system, as a source of coconuts for home consumption and as a source of fresh toddy. Some new varieties planted for their copra potential have proved less acceptable for local consumption—their main role, especially when copra prices are low.

In Western Samoa, tree crop planting has been used as a means of securing rights to large areas of new land, with the result that land is soon likely to become scarce for normal subsistence production.

Self sufficiency in food

In all five countries covered in this paper, a major focus of their economic programs has been to increase exports. This has had some success in Solomon Islands, and a little in Western Samoa, but in the other three countries export trade remains very small. But at the same time, imports of food have rapidly increased.

In most of the Forum island countries almost all the population could be sustained adequately on the basis of locally produced foods. This is certainly so in Solomon Islands, Western Samoa and the Federated States of Micronesia, but also (though with more difficulty) in Tuvalu and Kiribati. There are three problems hampering these countries' self sufficiency in food.

The lack of adequate linkage infrastructure between the small producer and the urban population. Problems of processing, storage, packing, transport, and marketing organisation for local foods have in most Forum island countries...
received inadequate attention. As a result, it is difficult for urban people to rely on regular supplies of local foods, in good condition, and at an acceptable price.

- A change in food preferences is taking place, favouring imported foods because of their greater ease of storage and preparation. In some cases (notably the Federated States of Micronesia) a taste preference has also developed, associated with enhanced prestige derived from serving imported foods.

- A means of paying for the imports. In many countries the local availability of imported foods is only possible because aid flows from foreign countries are permitted to be used for local wages and consumption items. As a result, the countries concerned develop large balance of trade deficits. These deficits are caused by the aid flows which should in fact be used to make them unnecessary.

Aid flows could be used to reduce deficits but have generally failed to do so because development has been seen as being concerned only with commercial and export-oriented activities. The subsistence sector has been neglected as an intrinsically backward and uninteresting sector both to development economists and to governments. So the field of economic activity in which the Forum island countries have their greatest, and in some cases their only, comparative advantage, and which alone can ensure their economic and political independence, has not attracted the attention it should have received. Compared with the research and development effort that has been put into the agriculture of grain producing countries, the highly productive indigenous agriculture of the Pacific island countries has received very little attention, and what has been done (such as the University of the South Pacific's Alafua research) has been largely ignored by government departments and agencies.

**Decline in the subsistence sector**

Decline in the subsistence sector is difficult to define. It could refer to any one of a number of changes that have taken place, or might do so. There is some decline observable in the subsistence sector over the long term, mainly due to the following factors.

- Population growth is high in all the countries here reviewed except Western Samoa, and it exerts pressure on scarce resources. This is fairly obvious in some areas, as on some outer islands in the Federated States of Micronesia, in most of Kiribati and Tuvalu, and in a few areas of Solomon Islands. However, it is an insidious factor, and even where its effects are not immediately apparent, it tends to lead to a decline in productivity in the long run.

- In most Forum island countries, cash-cropping by semi-subsistence households has been strongly promoted, but mainly for export crops.
Some land and inshore fish resources are being degraded. One local cause is often population pressure, but export-oriented cash-cropping taking over the best and most accessible land has been another cause, especially when combined with problems arising from customary land tenure. Instances in North Malaita in Solomon Islands, and in parts of Upolu in Western Samoa are cited in the report.

The combination of cash incomes and cheap imported foods reduces the incentive to produce traditional staples, particularly when they require considerable time and effort, as with babai and pulaka pits in Kiribati and Tuvalu, or where population pressure and/or cash cropping has reduced the fertility and accessibility of food gardens.

Decline in population

There has been a significant movement of people out of the subsistence sector into the cash economy. This has taken place in all the five countries here reviewed, and in some cases this movement has involved migration overseas.

Migration overseas has not been significant in Solomon Islands, but Tuvalu and Kiribati have exported labour to Nauru and to work on foreign ships. The Federated States of Micronesia has exported labour to Guam and the Marianas, and under the terms of the Compact of Free Association may do so to the United States. Western Samoa has exported very large numbers to American Samoa, the United States, New Zealand and Australia, producing benefits through the receipt of remittances which now are the greatest contributor to its balance of payments. These Samoan migrants are usually long term, but migrants working in Nauru are likely to have to return to Tuvalu and Kiribati as phosphate mining winds down. Many have already done so. When these migrants return they usually seek wage and salary employment in their own country, but if this is not available, as is often the case in Tuvalu and Kiribati, they may have to return to the subsistence sector. However, they often bring with them capital, new skills and experience, and new tastes for non-subsistence goods.

Internal migration from the subsistence sector to urban areas can also be long term, especially for those with above average qualifications, who can secure government employment at above the minimum level. On the other hand, quite a lot of such migration is short term, and workers often return to their villages and re-enter subsistence sector living, perhaps with some savings or equipment acquired from their earnings. These people also send remittances or occasional gifts to their families of origin while they are away.

In a survey undertaken in 1988 of pupils who terminated at Standard 3 in Solomon Islands between 1984 and 1987, it was found that most of these had found wage labour in towns, but it was at the unskilled level and they found it boring and unrewarding.
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(Wene 1988). Most of them returned to their villages in twelve months or less, and expressed a strong preference for village life. At the time of the survey, two thirds of the respondents were living back in their villages. The report of the survey concluded that most young people prefer to live in their villages and in fact do so.

**Decline in productivity**

This has certainly occurred in terms of production of traditional subsistence goods, although in most cases it has been made up for by an increase in production of cash crops and other goods (sometimes fish) for sale.

The spread of cash cropping in Solomon Islands has in some cases caused a decline in subsistence production, due to the conversion of the best and most convenient lands to tree cash crops. In Tuvalu and Kiribati, the spread of cash incomes through government activity, made possible through the foreign earnings of their overseas investments, has enabled many subsistence families in the outer islands to reduce the heavy work of cultivating pulaka and babai and make greater use of rice and flour instead.

In other areas, reductions in productivity as a result of increased population pressure on resources are also becoming noticeable. This is an important long range problem.

**Food supplies**

One field of clear decline is internal self-sufficiency of food. In pre-colonial times, all five countries were self-sufficient in food, and at a level well above that of the majority of the world’s population. This changed gradually with the development of urban areas and the growth of wage labour, which created a need for large and regular supplies of foods to specific areas. For these purposes the traditional staple foods presented difficulties, for they were mostly perishable, bulky, difficult to transport and store, troublesome to prepare and cook, and came from widely scattered garden producers for whom there was no marketing infrastructure. Imported rice, flour and tinned goods on the other hand could be purchased in bulk, stored safely for long periods, and were convenient to cook and prepare. To add to these advantages, they were relatively cheap and supply was reliable.

This led to a change in diet for the urban populations and for most wage earners, so that this part of the population, which had previously been fed from the subsistence sector, now became largely independent of it. As cash cropping and other sources of cash incomes reached further into the subsistence economy, these imported foods also became available to producers in the mixed subsistence/cash mode, for whom the convenience of imported foods, ease of storing and preparation, and their role as a
status symbol, led to their wide adoption. As a result, there was a decline in reliance on the traditional subsistence foods, and the self-sufficiency and independence of the subsistence way of life was gradually eroded.

This was a gain for the subsistence households affected, at least in the short term. But, as well as making them dependent on uncertain external market factors, and in other cases (for example Federated States of Micronesia) on external aid flows, it also had serious long-term health effects. A UNICEF study of the Family Food Production and Nutrition Project stated that

[traditional Pacific island diets were high in complex carbohydrates from root crops, bananas and breadfruit and low in fat, salt and sugar. Pacific islanders now increasingly eat diets based on imported refined rice and flour, which are high in sugar, salt and fat (Schoeffel et al., 1991).]

This is leading to a rising incidence of non-communicable diseases including diabetes, high blood pressure and heart disease, an element of decline that is the more serious because it is not adequately understood by the people affected.

The subsistence sector has declined somewhat in food productivity, but has made up for this by increased monetary activity of one kind or another. However, the sector has shown a long-term decline in all five countries as the main source of basic needs for the population. There is also some incipient decline due to increasing population pressure on limited resources, although this has only developed to an appreciable degree in one or two areas. It must be expected to become an increasingly significant factor over time.

The degree and type of decline varies considerably from country to country. In Solomon Islands, decline in the subsistence sector is significant only in a few areas such as North Malaita and in some of the smaller islands. In Tuvalu, it is most noticeable in Funafuti, where the degree of urbanisation and overcrowding is most acute. In the outer islands of Tuvalu, at the time of the reports we received, the spread of sweet potato culture seemed to be sustaining the subsistence sector very well. In Kiribati there is a decline in Babai production, which is being replaced to a significant extent by rice and flour in local diets, and the innovative program of house gardens appears not to have been sustained.

In Western Samoa, on the other hand, the subsistence sector seems to have increased in importance and population in recent years, as it has absorbed back into subsistence living some of the labour previously employed in the monetary sector.

In the Federated States of Micronesia, however, there appears to have been a more serious and extensive decline of the subsistence sector, due almost entirely to the attractions of wage and salary employment from government distribution of the large grant moneys paid by the United States. Unfortunately most of this labour is relatively
unproductive, and while it is achieving a significantly higher standard of living for those who receive these payments, it has not produced new sustainable economic productivity that will eventually generate earnings to replace the grant moneys when they cut out.

Population pressure on resources

One important cause of change in the subsistence sector of the Forum island countries is population growth. If nothing else changes, an increase in the subsistence sector population will lead to diminishing returns of subsistence product per unit of land and per unit of human effort. If land is abundant and population pressure on the land is low, the effect may be very small, but it will still be there as subsistence gardens have to expand to less fertile or less convenient sites. Of course, other things do change, and improvements in technology or farming systems, amongst other things, can outweigh this effect (Fisk 1962). However, it is important to keep in mind this basic fact about population growth, and to appreciate the nature of other changes to subsistence production systems necessitated by population growth.

In Solomon Islands, the rate of population growth in recent years has been very high, and although this country is well endowed with land, and density of population (at about 10 persons per square kilometre) is not high, there are clear signs of excessive population pressure and of consequent diminishing returns in several areas, including the island of Malaita and some of the smaller land units such as Tikopia and Ontong Java.

In Tuvalu, land resources are very restricted, both in quantity and quality, and the population pressure from natural growth is made worse by the return of Tuvaluan workers and their families from Nauru as phosphate mining winds down. If this is exacerbated by the loss of land area through rising sea levels, population pressure on land resources may become acute.

In Kiribati, the situation is rather similar to that of Tuvalu, though at a less advanced stage. Kiribati is much larger, and present population density per unit of land is less than one third that of Tuvalu. However, the basic problems are much the same. and in the Gilbert Group, where most I Kiribati live, population density is already two thirds that of Tuvalu. Much of Kiribati's available land is in the Line Islands, and whilst the Government of Kiribati has instituted a resettlement program to move excess population from the Gilbert Islands to the Line Islands, the great distances involved make this a very difficult and expensive operation. Moreover, even if the ambitious targets for this resettlement scheme could be achieved, it would provide for only about half the natural increase expected during the course of the scheme, and will at best
provide only a temporary alleviation of the growing pressure of population on the country's land resources.

Western Samoa is in a different situation. Its land resources are quite large, and relatively fertile. Population density was about 55 persons per square kilometre in 1987, and population growth rates have been brought down to very low levels in recent years by emigration.

In the Federated States of Micronesia, population has been growing at the rate of 3.5 per cent per annum in recent years, and density is already at the fairly high figure of 139 persons per square kilometre—about the same as the Kingdom of Tonga. However the Federated States of Micronesia is at present less dependent on subsistence production for its basic needs, and is sustained by the very high level of food imports made possible by the grants it receives under the terms of its Compact of Free Association with the United States. Nevertheless, these grants are due to be reduced by stages over fifteen years, and serious difficulties appear likely to arise as these reductions take effect. It seems likely that a considerable effort will soon be needed to make greater use of under-utilised agricultural land in the high islands, much of which is reported to be very fertile.

Welfare

Welfare is difficult to assess because it depends on a wide range of factors, and on the subjective valuation or weight attached to the individual component factors. In the country report on Kiribati an attempt was made to achieve a rough ranking of relative welfare in the islands of the Gilbert group, but this was not attempted for the other four countries. For details of the welfare situation reference is directed to the relevant sections of the individual country reports.

In general, however, it is clear that considerable improvements have been made regarding access to amenities and services by rural households in all five countries.

In Western Samoa, for example, roads and tracks have been extended and improved so that nearly every rural household is within two hours travel or less of a centre which can provide most government services including hospital facilities. Moreover, by 1989 some 78.4 per cent of agricultural households had access to piped water supplies, and 59.4 per cent to electric power. As a result of the extension of these services, many village shops now have cold storage and stock frozen foods.

The other four countries cannot match this level of access to services, mainly for geographical reasons. Nevertheless recent years have seen considerable improvements. In Tuvalu, shipping services to the outer islands have been improved by the provision of a new ship from British aid, and much has been done to improve water supplies through the installation of tanks and roof catchments. In Kiribati, all the outer islands
of the Gilbert group except North Tarawa have an airfield and scheduled services vary from island to island from 1 to 4 flights a week. Amongst other benefits this greatly improves the medical service by facilitating evacuation of seriously ill patients. In the Federated States of Micronesia the flow of US grant aid has financed a higher income way of life for many people, especially in and around the State capitals. It has also initiated a considerable range of projects, but unfortunately does not appear to have sufficiently enhanced the productive capacity of the economy to compensate for the scheduled reductions in this aid. Welfare has, therefore, increased but is very fragile. In Solomon Islands much has been done to extend and improve transport and communications and the provision of services to the rural provinces and a general improvement in welfare has been achieved, though the difficulties in such a large and fragmented country remain enormous. Of particular interest is the devolution of a range of development powers to the provincial governments, although it is too early to assess the welfare effects.

On the down side the growth of population remains very high in all countries except Western Samoa, and this is exerting pressure on resources in some areas. This is becoming, or about to become, serious in Kiribati and Tuvalu, in some of the atolls of the Federated States of Micronesia, in parts of Upolu in Western Samoa, and in a few parts of Solomon Islands. There is also the decline in nutrition standards with the conversion to diets of cheap imported foods, and the specific health threat of the new strains of malaria in Solomon Islands.

Trade deficits

Of the five countries covered in this paper, all except Solomon Islands operate a very large deficit in merchandise trade. Solomon Islands has, on occasion, been an exporter on a considerable scale. Moreover, its exports are to some extent diversified, including fish and logs, each accounting for more than a third of the total, with palm oil and kernels, copra and cocoa contributing most of the rest. However it had a substantial deficit on foreign trade in 1988 and 1989, and a very large deficit on services. It therefore still depends heavily on foreign aid grants to pay its way. A striking feature of its trading performance is that food, beverages and tobacco account for a large proportion of its total imports, just on 20 per cent in 1990. This, for a food-producing agricultural country with a highly productive subsistence sector, requires serious review.

The other four countries are even less well placed in their trade with the external world, and only Western Samoa has any significant export volume at all. Nevertheless, Western Samoa in 1987 exported merchandise to the value of only WST25 million, but imported merchandise to the value WST130 million, leaving a trade deficit of WST105
million. However, remittances from Samoans working abroad made up for a large part of this deficit.

Tuvalu has very little to export besides copra, and when copra prices are low, copra exports bring little return. In 1989 these exports were valued at only about A$0.2 million, but Tuvalu imports were valued at A$5.6 million, of which A$1.7 million (or 30 per cent) was for food, beverages, etc. The Tuvalu Trust Fund is now the main source of regular foreign exchange.

In recent years, Kiribati has exported mainly fish and copra, and in 1989 total exports amounted to A$4.7 million. Imports for the same period amounted to A$22.3 million, of which A$8.1 million or 36 per cent was for food, beverages, etc. Kiribati has been able to finance this because it has substantial foreign exchange earnings from the overseas investments of its Revenue Equalization Reserve Fund.

The Federated States of Micronesia, on the other hand, recorded merchandise exports of only about US$2 million in 1989, against imports of nearly US$73 million, of which US$25 million was for food, beverages, etc. The main balancing factor in this case has been US grants under the Compact of Free Association. These grants are not intended to be permanent, and are scheduled to decline sharply over the next decade or so. There appears to be no immediate prospect of the Federated States of Micronesia generating new exports sufficient to meet even a proportion of these import costs. Imports may have to be radically reduced in the near future. There seem to be only three ways in which this situation can be met: by a substantial reduction in the standard of living; by a switch from imports to local production; or by a large exodus of population leading to a substantial in-flow of remittance income from citizens employed in other countries. In fact, the most likely outcome is probably a combination of these three, together, perhaps, with a flow of other foreign grant aid. In this paper particular attention will be paid to the possibility of replacing food imports with local production.

Generating foreign exchange

The problem of trade deficits is quite complex, and affects different countries in different ways. Imported goods or services have to be paid for with foreign exchange. There are are various ways in which Forum island countries can generate foreign exchange earnings.

Merchandise exports. Forum island countries are at some disadvantage in exports as they are very small scale operators on the international markets and the price of their exports tends to be set by forces entirely outside their control. Consequently their earnings, and what they can buy with them, vary widely from year to year.
Earnings from investments overseas. (For example the Kiribati Revenue Equalization Reserve Fund and the Tuvalu Trust Fund.) Except in dire emergency, a prudent government will first re-invest a proportion of these earnings, sufficient at least to maintain the real value of the fund and preferably to provide for a modest element of growth. Once that has been done, the balance of the earnings are as good as export proceeds and can be treated as such. They have the great advantage that, with proper management, this source of foreign exchange revenues should continue over the long term. On the other hand, the rate of return on such investments tends to vary due to causes the small countries cannot control.

Foreign borrowing. The trouble with this sort of funding is that it eventually has to be repaid, usually with interest, in foreign exchange. Overseas borrowing, even on concessional terms, should therefore only be undertaken when a substantial increase in foreign earnings can be clearly foreseen from which to make these payments.

Services. Of the five countries covered in this report, all have a net deficit on their foreign services account, as they require more services from the outside world than they provide in return. There are, however, some fields in which foreign exchange earnings in this category could be increased in the future if conditions are favourable. Tourism is one, particularly for Solomon Islands and Federated States of Micronesia.

Inflow of foreign investment. This can be beneficial if it develops productive industries that could not otherwise be financed or that require foreign know-how to be successful. However, there are disadvantages. Such investment, particularly in extractive industries tend to be large and lumpy, distorting the economy through heavy spending on labour and local materials in the investment stage, leading to the shock of contraction when the operating stage is reached. This is even more so if the resources exploited are not renewable.

Foreign aid grants. These grants are mostly intended for investment to increase the productive capacity of the recipient country and thus to make it more self sufficient. However, much of it is spent on internal labour and supplies, which accrue as cash incomes within the country, and are in turn spent on goods and services. In practice, much of this is spent on imported food.

Trade deficits are one of the serious problems with which all these countries have to deal, and much of their planning has been aimed at increasing exports in order to cope. The prominence of this problem is one of the reasons so much attention has been paid to the development of copra, cocoa and other export commodities in the subsistence or smallholder sector. However, the scope for reducing imports by increasing the local marketing of local foods has not been adequately explored.
Subsistence sector policies

Solomon Islands

Successive governments in Solomon Islands have, until recently, tended to neglect the subsistence sector, on the grounds that the need was for monetised economic development, and particularly for exports that would earn foreign exchange. The subsistence sector was seen as being well established and well able to look after itself.

Policy towards the subsistence sector was therefore largely centred on giving the subsistence producer the opportunity to earn supplementary money income through wage labour and through cash cropping. With the population so widely dispersed overseas and so fragmented geographically in the individual islands, transport was an intractable problem. Cash cropping was largely confined to copra, as it was a commodity that could be stored and withstand slow and irregular collection and transport.

For many years this worked reasonably well, and even with the fluctuating price of copra on world markets, smallholders were able to adjust by producing copra when prices made it worth while, and withdrawing from the market when prices were too low. Having their basic needs from their own subsistence production, this was not an unduly painful process.

Solomon Islands is a relatively fertile and productive tropical country, but in recent years it has had one of the highest rates of population growth in the world. Due to the relative abundance of land, this has not been seen as a particularly dangerous trend, but conditions are changing. In some areas, such as North Malaita and some of the small islands, population pressure on resources is mounting to serious levels. In North Malaita, there are areas where the expansion of cash cropping together with population growth are causing serious problems.

Cash cropping, particularly with tree crops, has tended to take over the best garden lands, as it has often been the practice to plant tree crops in food gardens whilst they are still in production. The result has been that food gardens have gradually been relegated to more distant and less fertile lands, increasing the labour involved in production and reducing the return per unit of effort. To make matters worse, once under tree crops, traditional tenure systems tend to withdraw that land from the bush-fallow garden cycle for decades, even if, as is sometimes the case, the tree crops are unproductive. In addition, the growth of population has increased the area of land needed for subsistence crops, and where land is limited by tenure problems or by lack of access, the fallow period is shortened and fertility declines, and crops are increasingly subject to attack by pests and diseases.
Tuvalu

Successive governments in Tuvalu have concentrated much of their planning efforts on expansion of the monetary sector of the economy. This is understandable, as it is clear that the opportunity to earn money incomes is a major felt need amongst the population. However the difficulties are daunting, and it is hard to see how this growing demand can be met. The demand seems likely to be increased by the return of Tuvaluan workers from overseas, and especially from Nauru.

The monetary sector in Tuvalu is mainly sustained by monetary inflows from overseas, which are then spread through the economy mainly by government, supplemented by a small private and cooperative sector. Much of this is concentrated in Funafuti, and to a small extent in Vaitupu. However, in 1987, 80 per cent of the economically active resident population obtained their main source of livelihood from subsistence production. Only 6 per cent obtained their livelihood from the private and Cooperative sector, whilst 13 per cent obtained it from government.

The opportunities for increasing foreign exchange earnings appear to be very limited. It seems that the main path for development in Tuvalu needs to be inward looking, aimed at making the subsistence sector more productive, more convenient, and more attractive, and at increasing the flow of marketed subsistence-type products, and especially food, into Funafuti and Vaitupu, thereby reducing the heavy food import drain on the limited foreign exchange.

Government policies towards the subsistence sector have been supportive, and considerable effort appears to have been put into increasing island production of sweet potato and varieties of taro. Much has been done to improve the quality of life in the outer islands through improved fresh water supplies and health support facilities. Education provisions, considering the difficulties, have been remarkable, and inter-island transport has improved.

Kiribati

The recent policies of the government of Kiribati are set out in the Development Plans for Aranuka and Kuria Islands, and appear to be on the right track. Their focus is on supporting the subsistence sector in the outer islands, improving living conditions there, and emphasising self-reliance. These policies include the encouragement of a reasonable degree of monetisation whilst avoiding action that endangers the viability of the subsistence production system.

Some valuable initiatives have been attempted, including the development of house gardens growing nutritionally necessary vegetables, and these appear to have had considerable initial success. However, with the departure of the Atoll Development
Officer, the strong pressure for improvement receded and the supply of seeds and planting materials faltered, and much of the ground gained was quickly lost. In other parts of this report attention is drawn to the need for development in the subsistence sector to be seen as a long term educational process, requiring persistence over a period of many years rather than a few months, and this seems to be supported by the experience in Kiribati. In other aspects of rural development, such as the improvement of internal communications within atolls, considerable progress is being made.

Kiribati has also embarked on a resettlement program to transfer surplus population from the Gilbert outer islands to the Northern Line Islands, and in this some progress has been made. The administrative and logistic difficulties imposed by the great distances involved are, however, delaying progress. Necessary though this initiative is, it is also necessary to recognise its limitations. Even if the full numbers intended to be resettled are in fact moved, it will only absorb about half the population increase expected in the Gilbert group during the period of the program. It relieves, but does not by any means remove, the problem of increasing pressure on land resources of the Gilbert group.

**Western Samoa**

The general attitude of Samoan governments, past and present, has been that the subsistence sector has adequately provided the basic needs of the rural people and that government intervention has been unnecessary. The Department of Agriculture, Forests and Fisheries has concerned itself almost exclusively with monetary activities and cash cropping. The University of the South Pacific’s Alafua campus has done considerable research on subsistence agriculture and on improved varieties of subsistence crops, and appears to have much to offer for the improvement of productivity in the sector, but by the end of the 1980s the Department of Agriculture had not included this direction of technical development in its program. Were it able to do so, it would assist in the practical adaptation and development of the research, and in the long term could bring great benefits to Samoan agriculture. Western Samoa’s main crop is taro, of which remarkably few varieties are in cultivation, and it is very vulnerable to the introduction of exotic pests and diseases. At some future date, new disease-resistant varieties could suddenly become of extreme importance. Moreover, the possibility of introducing higher yielding varieties could improve the output of the subsistence sector in cash cropping as well as on-farm consumption, and there is the further possibility that varieties with improved nutritional characteristics could be introduced.

The subsistence sector in Western Samoa has been remarkably resilient in recent years, when commodity prices and wage employment have been depressed, and this has contributed to the political and social stability of the country.
Another aspect of the rural/subsistence sector that requires attention in Western Samoa is the intensification of land use. Much land is used at very low levels of productivity, and much new land is being opened up for non-intensive uses. It is questionable how long Western Samoa can afford to continue in this way, and in some areas new land is no longer available. Here again more intensive systems of crop rotation will be required, and greater interest in the research undertaken at Alafua in this field would seem to be warranted.

Generally it seems that greater official attention to the subsistence sector, and to subsistence production systems in particular, is now needed, and that in this greater active collaboration with the Alafua research units should be attempted.

**Federated States of Micronesia**

In the Federated States of Micronesia the basic economic problem derives from the distortion produced by the payment of large wages and salaries in an overstuffed public service, financed by generous US grants, in an otherwise subsistence-based economy. In all states, two-thirds of wage and salary employment is in the public sector, where wages are said to be more than twice those in the private sector. The private sector comprises mainly services and depends on public sector spending and incomes.

The result is a largely unproductive, monetised economy built over a fairly productive but reluctant non-monetised subsistence economy. The main commercial activities are confined to the marketing and distribution of imported goods and apart from the production of fish, copra, and a small amount of pepper and bananas for export there is very little production of any kind for the market. There is a garment factory, but at the beginning of the 1990s, the machinery, raw materials, fuel, and even the labour (Asian women) were all imported. With the partial exception of Yap state, there has not even been any development of cash cropping in the subsistence sector, apart from copra—the price of which is now subsidised.

Government policies appear to recognise the nature of the problem, and to address themselves to them, but it is questionable whether the policies in place will be sufficient to produce the radical changes necessary to meet the situation.

On the national level the intention is to address the imbalance of trade and dependence on imported foods. But how this is to be done is less clear. 'Economic development' has been seen in the past to refer to commercial and industrial enterprise in the monetary sector, and it is difficult to see what developments of this kind are practicable in the economic environment of the Federated States of Micronesia on a scale sufficient to deal with the imbalances already in place.
Some attention is being paid to the encouragement of local food production to replace imports, but the problems are enormous. Not only is there no effective marketing organisation and little infrastructure for the supply of local foods to most of the urban centres, but there is also the problem that consumers have developed a strong preference for imported foods, and that they now have a cultural resistance to the consumption of some of the nutritionally most-needed of local foods.

In the Federated States of Micronesia planning is undertaken at several levels. Each state has its own plan, and these state plans show a reasonably clear appreciation of the general nature of the problems, and the directions that should be taken to correct them. They are, however, rather vague as to how these remedies are to be brought about. Considering the nature and magnitude of the problems, and the world-wide lack of experience in coping with them, this is understandable. Some of the best plans have come from outside, such as the UNICEF Family Food and Nutrition Project and the UNDP Integrated Island Development Project. However, these excellent initiatives have so far lacked the resources and the long term continuity needed to produce the major adjustments required.

If the scheduled reductions to the US grants under the terms of the Compact of Free Association are implemented, and if they are not replaced by other foreign aid sources, it seems that imports will have to decline sharply. There appears to be little in sight at the present time to suggest that increased exports or other foreign exchange earnings will take the place of the reduced inflows. In that case, even if the Federated States of Micronesia government does not place significant import duties on foodstuffs, food imports are likely to become scarcer and more expensive, and this eventually may make the marketing of local foods more attractive.

There can be little doubt that the Federated States of Micronesia is physically capable of feeding itself from its own resources, and of maintaining a healthy standard of living. It seems unlikely, however, that it can continue with the style of life it presently enjoys, except as a state dependent on outside aid. Independence, political and economic, seems to require a much more radical set of development policies, with much more emphasis on subsistence production, development of cash cropping in local foodstuffs and an elaborate infrastructure of transport and marketing organisation to make adequate supplies of such foods available to the urban populations. It would seem also that some hard decisions will have to be made, reducing numbers, incomes and low productivity in the public service, and the acceptance, for a time at least, of a lower standard of living. These developments will not take place easily nor in a short time period, and the policies for overcoming existing difficulties will require persistence and a long-term program, beginning with education at primary school levels.
Of paramount importance will be the expansion of subsistence and semi-commercial agriculture and fishing. The expansion of cash cropping, moreover, should focus on existing subsistence crops supplemented by new crops of nutritional importance that can be integrated into the existing subsistence system.

The way ahead

All five countries have substantial deficits in their foreign trade. In all cases, food imports are a large factor in this deficit. It is suggested that greater effort should be directed to increasing the commercial production and distribution of traditional foods from mixed cash/subsistence farms, food for local consumption should be given more priority than export crops for smallholder cash-cropping, and that food imports could and should be gradually reduced. Provided adequate measures are taken to overcome the difficulties of ensuring adequate production, transport and distribution of traditional foods, import controls and/or import duties could be used to encourage this process.

In most of the Forum island countries there is no reason why almost all the population should not be sustained adequately on the basis of locally produced foods. This is certainly so in Solomon Islands, Western Samoa and the Federated States of Micronesia, but also—though with more difficulty—in Tuvalu and Kiribati. There are several major problems that hamper this.

- There is a lack of adequate linkage infrastructure between the small producer and the urban population. The special problems of processing, storage, packing, transporting and marketing traditional foods are daunting and in most Forum island countries have only partially been solved. It is still difficult for urban people to rely on regular supplies of local foods, in good condition, and at an acceptable price. These problems are solvable, but will require a change in priorities, and the implementation of a sustained long-term program, to produce the required result.
- A change is taking place in food preferences, favouring imported foods because of the convenience derived from their greater ease of storage and preparation. In some cases (notably the Federated States of Micronesia) a taste preference has also developed, associated with enhanced prestige derived from the serving of imported foods.
- A short-term exogenous means of paying for the imports has emerged. This is particularly significant in the Federated States of Micronesia where exports are very small and food imports very large. These imports are only possible
because aid grants from the US provide the foreign exchange to pay for them. This is short-term, because the terms of the Contract of Free Association provide for the scheduled reduction of the grants, and there is no indication that internal productivity of the Federated States of Micronesia economy is being sufficiently increased to make up for this reduction. It is not impossible that aid flows could have been used to stimulate local food production from the subsistence sector, but the subsistence sector has largely been neglected as an intrinsically backward and uninteresting sector both to development economists and to governments.

These problems have been discussed in the paper, and long-term measures suggested for dealing with them.

Traditional Pacific island diets, which are high in complex carbohydrates and low in fat, salt and sugar, are giving place to diets based on low cost imported foods which are based on refined carbohydrates, and high in sugar, salt and fat. This change increases the incidence of non-communicable diseases such as diabetes, high blood pressure and heart disease, raising health costs and impairing welfare.

The concentration of large numbers of people in urban centres, factories and plantations, creates a demand for food that has characteristics the indigenous systems of subsistence production have difficulty in meeting: demand is located remote from the producer and is often for very large quantities of food; the food has to be available at frequent intervals, preferably daily; the supply has to be absolutely reliable; and the price has to be reasonable and steady. These requirements are frequently met by importing storable grains, tinned foods, and cheap frozen cuts of meat such as mutton flaps and turkey tails, provided foreign exchange is available to pay for them. Unfortunately, this means that the income and employment effects of the urban and estate food consumption are exported, rather than spread amongst the rural population of the country. Moreover, in most cases the local cost of food imports is in effect subsidised by aid inflows of foreign exchange, without which the rate of exchange could not be sustained, and the local costs would rapidly increase.

To match the security of imported foods an effective, fast, relatively inexpensive and completely reliable transport system reaching far into the rural or outer-island areas is required. In addition, the availability of sufficient surplus production from the mixed subsistence household must be ensured. This necessitates a great deal of organisation and effort, especially in the initial stages. Moreover, it is a long-term requirement that must be sustained for many years.

Modernisation of the economy with emphasis on industrial development and the growth of exports is nice if you can get it, and should be pursued where the opportunity offers. However, in many Forum island countries, geographical and economic constraints severely limit the scope for such development. Attempting to go beyond that limit can lead to frustration and to a waste of resources. There are other ways of
improving the lives of the peoples, and these should be actively pursued, particularly when the alternatives are unpromising.

Small, isolated and fragmented countries and, even more so, small isolated and inaccessible communities within those countries, operate at a comparative disadvantage in their dealings with the outside world. This is now widely recognised. However, it is less widely recognised that those same factors provide a comparative advantage to the local small scale producer of goods for local consumption. The smaller and the more inaccessible the community, the greater the comparative advantage available in this way. This is one reason self-subsistent agriculture and fishing has persisted so long in Forum island countries.

The subsistence sector is still very strong in the Pacific island countries. In the five countries reviewed, although very few households are now entirely subsistence dependent, from 50–80 per cent of the population still get a major part of their basic needs from non-monetary subsistence production. The proportions of the population so identified in this report are

- Solomon Islands—about 80 per cent of the population
- Tuvalu—about 80 per cent
- Kiribat—about 80 per cent
- Western Samoa—about 60 per cent
- Federated States of Micronesia—at least 50 per cent and probably more.

The subsistence sector, in its mixed subsistence/cash mode, is the source on which the majority of the population of the Forum island countries depend for their basic needs, and in which they have the greatest, and in some cases their only, comparative advantage. Further, it is largely this mode which enables them to be economically and politically independent of outside influences when they so choose. It is also the basis of their culture and identity. Similarly, opportunities for cash cropping through sale of traditional foods from mixed-mode producers to urban and industrial workers are to a considerable extent neglected, because the problems constraining such sales have not yet been adequately overcome.

Compared with the research and development effort that has been put into the agriculture of grain producing countries, the highly productive indigenous agriculture of the Pacific island countries has been relatively neglected, and what has been done—as in the University of the South Pacific’s Alafua research effort—has not received the attention and support that it deserves from government departments and agencies. The reason is partly that the inner functioning of the subsistence production system and its potential for development has not been sufficiently understood, and partly that it has been thought that the subsistence sector does not itself warrant intervention. It is here suggested that these reasons are in error.
The new policy directions suggested in this paper and in the individual country reports are necessary to avoid the frustrations of ineffective use of aid in the pursuit of objectives that are neither attainable nor practicable in the context of present-day conditions. Attention needs to be paid to the development potential of the subsistence base in the indigenous culture of the islands. There is a need for more good leadership from within, and less unquestioning acceptance of guidance from outside. This leadership needs to understand the internal workings and needs of their own society and culture, and to exercise discrimination in its acceptance of the advice with which it is sometimes swamped. In particular, it needs to avoid the temptations of wishful thinking about quick and easy paths to rapid economic growth and the pursuit of goals that are unlikely to be attainable.

The number of national and international aid agencies active in the Pacific islands region has grown considerably in the last two decades, as has the scale of operation of many of them. A considerable proportion of their operations are of high quality and merit, but there tends to be a degree of compartmentalisation between their efforts whereas close coordination is necessary. In addition, individual projects are at times under-funded and/or sustained for too short a period to be effective. This is particularly restrictive when dealing with culturally and economically complex matters involving the modification of human activity and attitudes in the traditional subsistence sector. In those cases a carefully coordinated and sustained long-term approach is necessary. Integrated Island Development Plans and similar programs approach this requirement, but in some cases are less successful than they could be, due to under-assessment of the length of continuity and scale of funding necessary to make them fully effective.

Despite the relative neglect of the sector, the subsistence sector has retained considerable resilience, and where world commodity prices have fallen, or other components of a country’s foreign exchange income have declined, the subsistence sector has absorbed much of the slack by taking people back into subsistence living and sustaining them without serious deprivation.
APPENDIX A

Outline work program for development of the subsistence sector

Rationale

The subsistence production system itself has been relatively neglected as a subject for economic development, partly because it has been assumed to be unable to contribute directly to overall development, and partly because it has been assumed that it did not need, or could not benefit from interventive action. Neither assumption is correct.

Improvement in the productivity of the subsistence operation can increase the capacity of the subsistence household in three ways.

1. By increasing productivity per unit of land, it can reduce population pressure on land resources, make more land available for cash cropping, and increase the capacity of the sector to contribute to the market economy.

2. By increasing productivity per unit of labour effort, it can release labour for other forms of production and/or reduce the disincentive to produce.

3. By increasing the quantity and nutritional quality of internal food supplies it can increase the health and welfare of the subsistence population, and reduce the need for food imports.

It is therefore suggested that a work program should be undertaken to help Pacific Island countries foster the development of their subsistence sector activities, with the following objectives.

Objectives

To increase the productivity and broaden the resource base of subsistence agriculture, to reduce imports of processed foods, to improve nutritional health, to provide a production base for cash agriculture, (especially through the marketing of foods), and to enhance the productivity, safety and ease of artisanal and subsistence fishing. [This is a slightly edited version of the objectives for some of the UNDP/SPC Integrated Atoll Development Programs].

These aims are already being pursued, but our survey suggests that they need to be given greater importance in the overall planning of many Forum Island countries, and that a sustained, longer term and even more comprehensive approach than has yet been attempted, is needed. For example, the excellent Integrated Atoll Development program applied to the island of Tamana in Kiribati in the 1980s had striking initial
successes in some directions, but the effectiveness of the measures tended to fade when the development pressure was reduced. Similarly, the excellent UNICEF Family Food Production and Nutrition Project in the Federated States of Micronesia showed initial promise, leading even to the production of valuable new garden vegetables, but many families refrained from eating them. The program there was deemed to be insufficiently sustained and under-funded. It is suggested that the Forum countries should be encouraged and assisted to aim for a longer term, more comprehensive program along the lines proposed below.

Methods

The methods adopted need to be coordinated to cover many different aspects of the subsistence operation and its setting. They are here divided by type of function required.

1. Agricultural

**Improved varieties of traditional food crops.** Provide the subsistence farmer with improved varieties of traditional crops, offering some of the following characteristics:

- higher yields
- greater resistance to disease or pests
- better storage, transport and shelf-life
- adapt satisfactorily to local conditions
- are acceptable in taste and texture
- provide improved nutrition, through increased protein or vitamin content.
- are convenient to prepare and cook
- fit the subsistence social and productive system.

**New food crops.** Introduce the subsistence farmer to new food crops that fit readily into the subsistence farming system and (i) remedy existing nutritional gaps and (ii) are acceptable to consumers.

**Improved farming practices.**

- Introduce subsistence households to improved cultivation and rotation systems that will improve long-term fertility and reduce the effects of shortened fallow.
- Provide training and support for systems of mulching, addition of trace elements, and other inputs where indicated.
- Provide the institutional support and back-up necessary and ensure that the necessary inputs required are continuously available in the long term.
Note: Much of this is already in progress in various places and in separate programs. For example, the University of the South Pacific Institute for Research and Extension in Tropical Agriculture has much of this in hand, but much more use could be made of it if properly integrated into overall development action by individual governments and agencies. Some components, such as storage characteristics, storage procedures and processing possibilities may merit more priority. The education and publicity aspects require a much broader and long-term approach.

2. Access

This is important at two levels.

- Local, providing access to productive land. Roads, tracks, channels, causeways, landings, canoes, hand carts and bicycles etc.
- To main markets: roads, buses, lorry services, shipping and other water transport, air transport in special cases.

3. Market infrastructure

Most countries have some such infrastructure in place, though not all functions are always covered effectively and many areas are not adequately served. An interchange of information of experienced gained would be beneficial. Fiji and Western Samoa have some useful experience of this type of development.

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