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ISSUES IN FOOD POLICIES IN THE SOUTH PACIFIC *

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An objective of most South Pacific Island nations is to raise living standards; an objective that can only be achieved in most of these countries through a transition from subsistence to cash cropping. Yet many governments in the region emphasise food self-sufficiency at national and, in some cases, at farm-household level. In the paper the effects of the transition from subsistence to cash cropping at farm-household level on resource use, income and equity, nutritional status and food security are considered, drawing on research conducted in Solomon Islands and Tonga. It is shown that the change will often increase family welfare, including the nutritional status of children, but that there may be negative impacts on equity, food security and nutritional status of adults. Policy prescriptions and suggestions for further research arising from the issues addressed are presented.

1. ECONOMIC GROWTH AND THE TRANSITION TO CASH CROPPING

Raising the standards of living of the majority of their people is an objective of almost every South Pacific Island Nation (SPIN). Since in most countries the majority of the people live in rural areas and depend largely on farming for their livelihoods, the transition from subsistence to cash cropping in a prerequisite for sustained economic growth yielding higher real rural incomes. Subsistence systems do not have the capacity to provide the range of goods and

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services that people have come to see as necessary or desirable, and opportunities to earn cash incomes outside of agriculture, at least in most of the countries, are still too limited to meet the aspirations of more than a small proportion of people.

Mellor (1986), among other economists, has emphasised the vital contribution that the agricultural sector must make if overall national development efforts are to succeed. Except in very unusual circumstances, there is no short-cut to raised living standards: agriculture, which initially at least is the predominant sector, must be mobilised as the engine of growth, creating direct employment for the growing population, earning foreign exchange to pay for essential imports, providing food for the developing urban sector, providing savings for investment in secondary and tertiary industries, providing, through raised rural incomes, a strong local demand for the products of those industries, and, later on, releasing workers to take up urban jobs as the numbers of these eventually grow substantially. Clearly, none of this is possible if agriculture stagnates at subsistence level.

Seemingly in conflict with the above view, the goal of self-sufficiency still looms large in the thinking of policy makers in SPINs, as revealed in the Development Plans of many of them. Moreover, self-sufficiency is advocated by some at both the national and at the individual farm-household levels. The focus in this paper is on self-sufficiency at the latter level, although some implications for agricultural trade are also drawn out.

For reasons that have been well understood since the times of Adam Smith, the 'ideal' of self-sufficiency for the mass of rural households can be seen to be incompatible with other development objectives being pursued by the SPINs. Yet various arguments are put forward in favour of farm-household self-sufficiency. It is seen as state of self-reliance, as a

means of avoiding the risks in the environment (notably, market risks), as a way of avoiding things (such as mass-produced consumer goods) that might contaminate an idyllic rural life-style, and as a way of ensuring that nutritional status is not undermined (by changing diet towards less nutritious, 'non-traditional' foods).

The necessity of bringing subsistence households into the market economy to enable higher incomes to be earned does not imply that the transition will be achieved easily and without concomitant problems. Subsistence systems that developed over many centuries were generally well adapted to the environments in which they existed. Similarly, the social relations in which those systems were embedded had also stood the test of time. It is not surprising that dramatic and rapid transition to cash cropping is not always smooth. It is the purpose in this paper to examine some of the difficulties and problems encountered in some SPINs, as revealed in part by results of the South Pacific Smallholder Project (SP2), and to review what remedial action is needed. The SP2 results are presented in various reports and papers, but particularly in Hardaker, Delforce, Fleming and Sefanaia (1988) for Tonga - hereafter referred to as HDFS - and in Jones, Fleming and Hardaker (1988) for Solomon Islands - referred to as JFH.

2. ANALYSIS OF THE EFFECTS OF TRANSITION

2.1 Use of Productive Resources

The most obvious effects of the change from subsistence to cash cropping on resource use is on the land resource. First, some smallholder land may be allocated to plantation cash crops and so become unavailable for subsistence gardening. This effect and its consequences were noted, for example, in North Malaita where much of the more accessible coastal land has been planted to smallholder coconuts and/or

cocoa (Frazer 1986). Because of the poor levels of fertility of the soils, it was generally thought that it was not possible to intercrop such plantations with food crops. The consequence has been that growers of subsistence crops (chiefly women) must walk long distances to food gardens relocated on land higher up the hillside and not suitable for cash crops. Subsistence production suffers in consequence, while cropping of steep slopes causes erosion. However, regression analysis of data from households in five Solomon Island villages shows substantial variation between villages in the effects of cash cropping on garden area (JFH, section 9.1.5). In some villages a positive association was found, suggesting no competition for land and, indeed, some complementarity between the two types of production. In other cases, however, new plantings of tree crops had a clear negative impact on garden areas and there was evidence that the negative effect is likely to become more pronounced in future as tree crop plantings are expanded and competition for land intensifies. For example, in an examination of future scenarios for export crop expansion, it was predicted for one village already growing large amounts of cocoa, that, even taking an optimistic view, a doubling of the present area under tree crops would reduce garden area to one-quarter the present size (JFH, section 9.1.7).

The expansion of cropped area associated with cash crop production may also put in danger the traditional methods of land management, with potentially serious consequences for the long-term productive capacity of the land. For example, in most SPINs, traditional farming is based on bush fallowing. If land is limited and if some of it is allocated to cash crops, often long-term tree crops, the fallow periods on the remaining land may be shortened to a point where the sustainability of the system falters. JFH have shown for the Solomon Islands data mentioned above how the same pressures to reduce garden areas also lead to shorter fallow periods (section 9.1.6).

The danger is perhaps less where cash cropping and food cropping are integrated on the same land, as is common in Tonga, for example, but even here the intensification of production may have some undesirable consequences. Kunzel (1988) has shown how the more intensive cropping of Tongan smallholdings, and particularly the increased use of tractor cultivation, has reduced the number of useful trees. Not only does this mean that the products of these trees are unavailable to the people, but the advantages that trees bring in soil fertility maintenance, for example by recycling plant nutrients from deeper soil layers, are lost.

A shift towards cash cropping also imposes changed demands on labour. If cash crop production is to be combined with subsistence cropping, there is inevitably an increase in the time that must be allocated to farming. Fisk (1964) introduced the notion of 'subsistence affluence' to characterise many traditional SPIN agricultural systems, wherein basic subsistence needs could be satisfied by a minimal labour input. However, changing circumstances, such as population growth and increased cash cropping, mean that such conditions nowadays seldom prevail. As HDFS showed for Tonga, the time of both men and women in smallholder households is very fully occupied with the amount of time spent on economic activities per week in the four villages studied averaging between 51 and 64 hours for men and 55 to 68 hours for women (HDFS, Figure 4.2). Comparable figures for the villages studied in Solomon Islands reported by JFH range from 33 to 47 hours per week for men and 39 to 52 hours for women. Evidently, the Solomon Islands households have not yet reached such severe pressure on labour as in Tonga (as reflected in agricultural wage rates in Tonga more than double those in Solomon Islands), but the shift from subsistence affluence is clear in both countries.

Extra labour for a further expansion of cash crops may be supplied in one of a number of ways. One reaction may be

a breakdown of the traditional sexual division of labour. In Melanesia, where women traditionally were the farmers, men now often participate in cash cropping and may also undertake more food cropping work than before. For example, in the cash cropping village of Manakwai in Solomon Islands, women now spend 29 per cent of their agricultural work time in cash cropping while men devote their time equally between cash cropping and gardening (JFH, Figure 4.2). In the still more commercialised village of Tamboko, women devote 40 per cent of their agricultural time to cash cropping while in the more subsistence-orientated villages of Gwai'au and Haimarao, they spend less than 5 per cent of agricultural time on cash cropping. In Polynesia, where farming was traditionally men's work, women are increasingly engaging in agriculture, particularly in post-harvest tasks such as copra drying, but also in specialised work such as vanilla pollination in Tonga. Fleming with Tukuafu (1986) have shown that women in the 35-44 age group average almost an hour a day spent on crop production.

Another solution to the problem of increased labour needs lies in the adoption of labour-saving methods such as mechanisation or chemical weed control. Such methods are increasingly widely used in Tonga where shortage of labour for farm work has become a serious problem for some producers. Machinery and labour-saving purchased inputs are not yet used to any great extent in Solomon Islands, but a production function analysis has shown high marginal productivity for purchased inputs in cash crop production in the one village where any appreciable use of such inputs was found (JFH, section 4.5.2).

Yet another reaction to the labour demands imposed by increased cash cropping, and the economically rational one in many cases, is to substitute cash cropping for subsistence production, at least to some extent. Individual households may decide that their time is better spent in earning cash,

some of which is used to buy food, than in seeking to be self-sufficient. Such a response is merely part of the process of specialisation of labour that characterises economic development. The effect, of course, is likely to be a rise in cash income levels (see section 2.2.1), with substantial impacts on the pattern of household consumption (section 2.2.2).

2.2 Income Levels and Consumption Patterns

2.2.1 Relative income levels

Higher levels of rural income would be expected with the transition from subsistence to cash cropping by farm-households, since otherwise smallholders would not be encouraged to make the change. This is not to say that those households with the highest incomes from cash cropping are necessarily the wealthiest, since comparisons may be confounded by income from other sources, such as wages or remittances. Nevertheless, data from the SP2 in Tonga do illustrate how incomes are improved by involvement in cash cropping vs subsistence production (HDFS, Figure 4.6). The households in Mataika in the outer island of Vava'u, for example, where vanilla growing is an important activity, recorded an average cash income of T$84 per week, some T$20 of which was from sale of crops (plus a further amount from wage employment in vanilla plantations). For Ha'ano village, in the outer island group of Ha'apai where cash cropping opportunities are much more limited, the average income was only T$55 per week, of which T$8 per week was from crops. On the other hand, the other two villages of Ha'akame/Ha'alalo and Navutoka on the main island of Tongatapu both had lower cash crop sales per household than Mataika (though above those of Ha'ano), yet had higher total cash incomes due to greater flows from other sources, notably remittances from relatives overseas.

2.2.2 Equity effects

South Pacific societies have historically had a reputation of being egalitarian. Under conditions of almost pure subsistence, differences in income are limited by the amount of food that can be consumed, by the relatively egalitarian nature of most customary land tenure systems, and by the small amount of accumulated capital. Comparing this view with what exists today, it is easy to conclude that the introduction of the cash economy has widened disparities in wealth and income between rural households.

Virtually all SPIN farm-households today are at least semi-subsistent, and it is not uncommon for these households to have accumulated at least small amounts of capital. The major cash cropping activity into which most farm-households ventured a long time ago was copra production. This introduced a major capital asset - the growing plantation of coconut palms - with the potential to create greater divergences in income between households. Evidence from the SP2 indicate that in one of the villages surveyed in Solomon Islands (Haimarao), the distribution of palms among households is very unequal, providing the potential for considerable divergences in levels of cash incomes (JFH, section 7.3).

Despite the growing importance of capital with increased cash cropping, evidence in the SP2 data for four Tongan villages shows that income distribution is not noticeably less equal in the cash cropping village of Mataika than in the other three villages surveyed. However, some caution is needed in interpreting this finding as productive capital is most skewed in Mataika. It might be that the trend towards greater inequality in capital is still in an incipient stage given the relatively recent upsurge in vanilla plantings in

that village, and that greater income disparities will emerge in the next decade (HDFS, Ch. 5).

One factor counteracting the negative effects on equity that might flow from more unequal income distributions in the future is the way in which income is redistributed within the village. The greater social obligations placed on high income earners ensure that a significant portion of their income is redistributed in one way or other to the less well off. However, the SP2 has revealed surprisingly high degrees of inequality between households in the villages studied in both Tonga and Solomon Islands (HDFS Ch. 5 and JFH Ch. 7). One concern for the future is that such inequalities may become still more marked as capital accumulation becomes more practised among the more commercially-oriented farmers. Indeed, changed cash management practices, including a higher propensity to save for productive investment, and so to resist pressures from relatives and friends to redistribute available funds, may be a prerequisite for the increased commercialisation of agriculture.

A factor that has probably militated against growing inequality of income has been the continuing importance of customary land in most SPINs. In principle, at least, the fact that, typically, everyone in a village has access to land means that a class of landless labourers is unlikely to emerge. Widespread access to land should mean that one major factor of production that could cause disparities in income does not do so. In practice, the ideal village situation does not always prevail. Depending on local conditions, access to land can vary considerably, often dictated by social conditions in the village. Also, in parts of some SPINs, such as North Malaita where a survey village of the SP2 (Manakwai) is located, land scarcity is becoming a major problem (Frazer 1986). Current land tenure arrangements are frequently antipathetic to improved land management practices and, together with high population growth rates, exacerbate

land scarcity problems. The outcome will most likely be growing income inequalities as more people have to compete for a limited number of jobs outside the agricultural sector.

Finally, even if intra-village equality in wealth and income is maintained, there can still be growing national disparities if the incomes in the rural areas lag behind those of people employed in urban areas. The spectre of a backward agricultural sector is already sufficiently in prospect in many SPfNs to call into question the development strategies being followed. Current thinking of policy makers in Tonga is a case in point. A strategy of keeping the smallholder agricultural sector as a predominantly subsistent, low-technology society while concentrating development efforts on a few high-cost, urban-based investments will reinforce a vicious circle that leads to growing disparities in income between the urban and rural population.

2.2.3 Changing demand for food crops

Transition to cash cropping by farm-households can be achieved not only by entry into export production but also by producing food crops for the domestic fresh produce markets. The scope for this process in South Pacific markets is limited by the low populations of these countries. It can be boosted by production for the tourist trade in most SPINs, but linkages between the food production sector and the tourist sector tend to be weak (e.g. Faletau 1985, Dorrance 1986).

Root crops supply dominates throughput in all fresh produce markets although the mix of crops varies considerably between markets and over time within a single market. On theoretical grounds, relatively low price and income elasticities of demand would be expected for root crops sold in the fresh produce markets as these are the major staples

One aspect of economic development that affects the future demand for root crops, apart from relative income elasticities between food products, is the scope for adding marketing services to the food product in its raw state. Cook (1988) reports recent initiatives in Western Samoa by the Western Samoa Trust Estates Corporation to introduce new food products which are processed root crops. Similar initiatives are being made in other SPINs. It is still early days to judge the effectiveness of the processed root crop products, as distinct from the crops themselves, in competing for a share of the domestic consumers' budgets. However, if these efforts do not succeed, the commercial disadvantages of the root crops in unprocessed form, and the poorly developed nature of local transport systems, make it plausible to postulate that many SPIN farmers have no comparative advantage in the production of these crops for the local market.

2.3 Eating Habits and Nutritional Status

As noted, involvement in cash crop production will induce changes in consumption patterns. In particular, eating habits will change. JFH present evidence (section 6.2) that demonstrates the inroads made by imported grains, especially rice, in diets as cash cropping becomes more important in a village. Part of this effect is attributable to an income effect (particularly increased cash income). A further factor is the reduction of area of gardens and their more distant locations as a result of cash cropping. It might be expected that the convenience factor - less time needed by women for preparation of imported foods compared with time spent in growing and cooking root crops - would also be important. However, the fact noted above that women in Solomon Islands are spending more time in cash cropping, and might therefore be sensitive to other demands on their time, was found not to affect significantly consumption of the major root crops and imported staples (JFH, Table 6.3).

in SPINs. The evidence on income elasticities of demand for root crops in Tonga indicates a range of values between zero and 0.6 (Kingston and Antony 1986), all clearly inelastic. An important implication flows from this observation. As economic growth proceeds and incomes rise (in part from increased cash cropping), demand for root crops is likely to rise only marginally, and these crops will account for a relatively smaller share of market throughput.

Price elasticities of demand for individual root crops tend to be quite high, reflecting considerable substitutability (e.g. yams and sweet potato, and cassava and sweet potato in Tonga), complementarity between root crops (e.g. yams and cassava in Tonga) (Fleming 1986) and substitutability between root crops and other staples (e.g., plantain and yams) (Mallon 1986). However, aggregate price elasticity of demand for all root crops is quite low (Kingston and Antony 1986). Hence, the scope for expanding root crop surpluses for disposal onto the fresh produce markets without large price falls (and consequent loss of incomes to suppliers) is quite limited. In some countries (notably, Western Samoa and, to a lesser extent, Tonga and Cook Islands), export markets have been established for root crops, notably for taro. It is a matter of conjecture how price elastic export demand is for these products, but it is probably significantly higher than the domestic elasticities.

While low price elasticities of demand may not be good for farmers, expanded production can benefit urban consumers and thereby help to keep real wages in check. This can be beneficial in that the international competitiveness of domestic industries is enhanced (Mellor 1986). Evidence on this issue is difficult to find. Much depends on the degree of substitutability between root crops and imported staples (especially rice) among urban consumers.

How the change in diets will affect nutritional status is a matter of considerable contention. The potential effects are both positive and negative (Pinstrup-Andersen 1982) and whether the net impact is good or bad depends on the relative strengths of the factors applying in a particular case.

Where there is under-nutrition, the prediction from economic theory is that the raised incomes that will flow from increased cash cropping will lead to improved nutritional status, and there is some evidence to support this contention.. For example, the 1983 Southern Highlands Nutrition Survey in Papua New Guinea (Brogan and Crittenden 1986) showed that areas with a higher than average level of cash earning tended to have lower rates of malnutrition. At a national level in that country, Jackson (1981) showed that there was a direct and strongly negative correlation between economic development and the incidence of malnutrition. Also, SP2 work in Solomon Islands indicated positive relationships between cash incomes of households and the weight-for-age, weight-for-height and height-for-age ratios of children in rural villages (JFH, Ch. 6).

In addition to quantitative increases in food intakes as the result of higher incomes, there may also be qualitative improvements. Improved rural incomes should enable villagers to add variety to their diet, purchasing nutritious foods to supplement or replace home-grown supplies. In many parts of the South Pacific, particularly in those areas without access to fishing, while the traditional diet is adequate in terms of total energy requirements, it tends to be deficient in protein, particularly for nursing mothers and children. There is evidence from Solomon Islands of better nutritional status of children in households with higher purchases of rice. However, this probably reflects the benefits from greater consumption of tinned meat and fish, which were positively correlated with rice purchases (JFH, Ch. 6).

Despite these positive reports, there are also some negative findings. It seems that there are many intervening factors that can confound the expected positive relationship and that the net effects in any particular case depend on factors such as the extent of the actual increase in income from cash cropping, its distribution and composition, who controls the income within the family (men or women), effects on the allocation of time of household members, especially mothers, nutritional knowledge, and health and sanitation factors (Von Braun and Kennedy 1986, p. 3).

Traditionally in the South Pacific, women were responsible for the provision of food for the family. However, with the increased reliance on cash, men often have control over the income and so have had an increasing influence on the welfare of households. Studies have shown that women are more likely to provide for the family's food needs than men (see for example, Bender 1967 and Deere 1979). Moreover, some purchased foods have a lower nutritional value than the subsistence foods they replace (Grossman 1984) and many of the preferred cash purchases, especially by men, such as alcohol, tobacco and sugar, are detrimental to health.

It is for such reasons that concern has been expressed in recent times about the effects of changes in SPIN agriculture on the quality of the diet, and the growing incidence in some countries of 'Western' diseases of over-indulgence such as heart disease and diabetes (e.g. Parkinson 1982, Thaman 1982). While it is too early to be sure, the balance of the evidence would appear to support the view that the transition to cash cropping generally (but not universally) increases the nutritional status of children in societies where undernutrition is prevalent, but has negative effects on the health of adults, especially when combined with reduced levels of physical activity and with such predisposing factors as smoking and high intakes of alcohol and refined carbohydrates. These latter effects might best

be tackled by improved nutritional education rather than by the radical (and probably unsuccessful) strategy of seeking to condemn rural people to cash-starved subsistence production.

2.4 Food Security

Food security can be defined as the ability to maintain adequate consumption levels despite fluctuating production, prices and incomes (Roumasset 1982). Under a purely subsistence farming system, the only source of food insecurity is fluctuating production. The question as to whether the move from subsistence to cash cropping increases or decreases food security has been subject to much debate.

The case for negative effects of cash cropping on food security is based partly on the view that, as the reliance on purchased food increases, so does the vulnerability to changing food prices. Many of the preferred purchased foodstuffs are imported and buyers may find prices varying out of tune with changes in cash crop prices. Thus, cash croppers may experience unforeseen declines in real incomes if relative prices of imported foods rise (Grossman 1984 p. 8).

Similarly, many of the cash crops grown in the South Pacific are exported and are subject to the vagaries of export markets. Low world prices therefore can also lead to problems of low real incomes. Grossman (1984 p. 221) has reported that, in Kapanara village in PNG, the rapid decline in coffee prices in 1980, combined with a local erratic rainfall at the time which reduced yields, caused many to go hungry. The villages had been lulled into a false sense of security leading to a decline in subsistence production and therefore experienced reduced food production and cash incomes insufficient to purchase adequate food requirements.

The move to cash cropping implies greater reliance on the agricultural marketing system. Yet the marketing systems in SPINs have been criticised for their failure to support agricultural development (Fleming 1986). Not only are there problems in export crop marketing in some countries but also the domestic fresh produce marketing sectors are generally lagging behind those in other countries at a similar stage of development, with few signs of emergence of a strong merchant class. On both domestic and export fronts, an underdeveloped marketing system can obviously be a major constraint to achieving food security.

It has also been argued that the transition to cash cropping increases production risk. For example, as households attempt to increase production in order to have sufficient quantities to sell for cash, they tend to change the species and varieties grown. Yen (1976) reported that households tended to choose varieties that ripened over a shorter period of time to make marketing easier and selected varieties and species that were higher yielding and preferred in the market place. While this production of a narrow range of crops is probably efficient from a cash maximising point of view, it does, according to Yen, increase susceptibility to crop failure as a result of fungal and viral diseases and adverse temperature and moisture conditions.

Export crops in particular are often grown under monoculture, and so may be more vulnerable than mixed cropping practices to unfavourable environmental conditions. Therefore, when these crops are grown at the expense of subsistence production, income risk may be increased and food security consequently lowered. The evidence from Solomon Islands, however, does not fit this picture. Households in two of the three villages more heavily involved in export cash cropping grew a more diverse range of crops than in the two less cash-crop orientated villages (JFH, Tables 4.1 and 4.2).

Finally, it is argued that traditional food systems had resilience that may not nowadays be readily recognised. During periods of hardship, there was a change in the diet to less preferred foods such as forest fruits, nuts, and wild vegetables. With shorter fallows and other damage to the forest resources, both in part consequences of increased cash cropping, these alternatives are less available than before.

Yet the case for loss of food security with more cash cropping is by no means cut and dried. The contrary view is that increased participation in the cash economy will lead to an increase in food security because increased reliance on purchased foodstuffs enables a better matching of household food demand with household food supply. The main components of the subsistence diet, the root crops, tend to have a short storage life. Therefore, the increase in cash incomes which enables food, particularly high protein foods, to be purchased may not only increase nutritional levels but, because purchased foods such as tinned fish and rice are highly storable, may reduce the risk of seasonal food shortages.

In semi-subsistence smallholder systems, if a proportion of the cash earned from sale of crops is saved, it may be used to purchase food in periods of short-fall of subsistence crops or when cash incomes are in temporary decline. JFH (section 4.4.4) noted that village household expenditure in Solomon Islands at a time of low export crop prices appeared to be running ahead of cash incomes, perhaps through depletion of cash reserves. In such situations the transition to cash cropping would undoubtedly increase food security (Grossman 1984).

Clearly, the balance of all these positive and negative effects on food security is complex and will vary from case to case. More work is needed to resolve these questions.

3. IMPLICATIONS

3.1 Policy Prescriptions

A number of implications for SPIN policy makers flow from this discussion. First, and most important, is the need to adopt a more realistic and internally consistent approach to goal setting. It makes no sense to pursue simultaneously the objectives of raised living standards for rural people and of self-sufficiency. If rural development is to take place, and to serve as the catalyst for overall development, a well-designed development strategy is needed to guide the formulation of relevant policies and programs. These policies and programs need to include measures to relax the constraints on the transition to cash cropping as well as components to deal with potential or actual negative consequences of the change.

Expansion of cash cropping, both for export and for the domestic market, requires a parallel development of agricultural marketing systems and, as noted, there are grounds for concern that this aspect has been neglected in the SPINs. Institutional marketing arrangements need to be overhauled in many countries to create opportunities for more innovation. Promotion of private marketing organisations might offer a better prospect of success than seems likely from the present line taken in most SPINs of direct government involvement via statutory marketing boards.

The near certainty that the transition will lead to greater inequality in South Pacific societies needs to be recognised and confronted by policy makers. Possible responses are many. For example, some changes to taxation systems might be needed. Measures to provide a 'safety net' for those who are victims of the change may be needed since, in time, it may no longer be possible to rely on the extended family system to look after the disadvantaged. And while

some growth of inequality is unavoidable, there may be measures that can be taken to limit its extent. For example, traditional land tenure systems may be 'hijacked' by local elites to their own substantial advantage unless step are take to curb such action.

The negative nutritional effects of the transition also demand action. It is here that appeals for a return to the ways of the past seem unrealistic. Solutions for what is certainly a very real problem needing to be found through nutrition education. There seems no reason to suppose that the decline in death rates in the West that has been brought about through improvements in life-styles should not be transferred to developing countries, including the SPINs. Nutritional education programs already exist in many of the countries but need to be expanded, including the adoption of nutrition as a compulsory part of school curricula.

It seems likely that the net impacts of the transition on food security will generally be positive as incomes rise, but there may well be groups who are negatively affected. For them, the solution may lie in education about the risks they face. For the time being, at least, extension services and other rural development authorities should emphasise in their promotional work the importance of smallholders retaining at least a proportion of land in subsistence crops. These efforts will be enhanced if more agricultural research is directed to improving the productivity of food crops, thereby correcting the bias in the past to the export crops.

Many agricultural development projects are based on extending the transition from subsistence to cash cropping. It is clear that many of these projects in the past have been poorly designed and implemented (World Bank 1987). For the future, the designers and managers of such projects need to be more aware of the impediments to rapid change. Unless such projects address the constraints that limit the

capacities of smallholders to expand cash crop output, disappointments will persist. In addition, there is a need to be alert to the possible negative impacts that even successful projects can have and to include in the project operations measures to counteract or at least minimise these unwanted consequences.

There is scope for some rethinking about alternative approaches to resource exploitation, with projects aimed to use in situ resources of forests rather than clearing and planting for cocoa and coconuts (or logging). Good management of the rich variety of forest resources (e.g. birds, reptiles, valuable timber, butterflies, foods and other useful plants) can provide cash incomes as well as greater food security to villagers from a renewable resource, without the need to push food gardens further from the village or reduce garden size. Lack of information on the economic and marketing feasibility of these alternative forms of resource exploitation makes it difficult to judge their worth at this stage.

For reasons such as the evidence of the negative relationship between area planted to export tree crops and the length of fallow mentioned above, it is recommended that a policy be adopted to emphasise raising land productivity through improved cultural practices. By this means income levels could be raised without further large increases in the areas under cultivation.

Higher land productivity might be attained in a variety of ways, such as by encouraging increased intensities of intercropping, the development and promotion of higher yielding varieties of existing crops, or the introduction of new, more productive crop species. For example, intercropping of coconuts is rare in Solomon Islands (except with cocoa), yet is widespread in many other South Pacific countries. The possibility of introducing the practice

therefore appears to be a particularly promising line of enquiry.

3.2 Research Agenda

For the transition from subsistence to cash cropping to be as smooth as is possible, there needs to be research carried out in a number of priority areas. In the first place, because the population of the SPINs is growing rapidly and more land is being tied up with cash cropping, there is an increasingly urgent need for research on more intensive systems of farming which are environmentally, socially and economically well adapted to the needs and circumstances of SPIN smallholders. Unfortunately, research of this kind is of a long-term nature, so that it is expensive to conduct and it may be many years before useful results are achieved. On the other hand, some progress is likely to come from farmers themselves as they perceive the need to change methods to meet changed circumstances. A partnership between farmers, researchers and extension agents might offer the best way forward, perhaps within a farming systems research and extension framework (Gyles and Petelo 1988).

In addition, research in two SPINs has shown that women's time is fully occupied. Therefore, research into suitable labour-saving technologies is needed if cash crop production is to be performed without detrimental effects on child care or food production.

Processing is also a potentially valuable research field in the SPINs which are characterised by poor transport facilities and vast distances between markets. Simple, inexpensive processing mechanisms which reduce the perishability and/or bulk of crops, which increase value added and do not significantly reduce their nutritional or cash value are desirable, as are simple processing technologies which are suitable for small-scale operations.

Some such technologies suitable for the South Pacific have been developed or proposed in recent years; for example a system of fermenting cocoa in shallow trays which reduces the number of beans required in each fermentation batch or, more recently, a method of processing coconuts without first drying to form low value copra that is both adapted to small-scale implementation and with higher value products that copra oil (D. Etherington, personal communication, 1988).

Another area of priority research is in marketing. In many developing countries, including most SPINs, market research has not been part of the agricultural research process. Yet this is an essential activity if the transition to cash cropping is to be promoted. In the late 1960s, many farmers in Solomon Islands were encouraged to grow chillies and turmeric. Unfortunately there were limited market opportunities available for their produce and consequently much of the output was wasted. Not surprisingly, these farmers are now less inclined to pursue cash cropping opportunities.

It is clear that the transition to cash cropping affects diet and food security. Purchased foods, particularly products such as rice and tinned fish, are eaten in much larger quantities in the SPINs than they were previously. While quite a number of studies (including SP2) have examined the association between the intakes of such foods and the nutritional status of young children, less is known about the mechanisms involved and about the longer term effects. For example the effect of income level and source on the incidence of degenerative diseases of adults. To this end, there is a need for more work on the relationships between income, diet and nutritional status. Moreover, the task is a multi-disciplinary one, involving health and nutrition, agriculture and the social sciences. It is only through better understanding of the mechanisms at work that appropriate interventions can be designed to lessen the

negative effects of the transition on vulnerable groups in society.

Furthermore, as cash cropping increases and overall development of SPIN economies takes place, it is inevitable that more labour specialisation will occur and fewer households will supply their own food needs. As discussed, whether such changes will increase or decrease food security is a moot point, at least in the short run. The nature, magnitudes and impacts of risks affecting food supplies of various types of households, and of nations, during the transition urgently need research. A better understanding of the nature of the risks to food security is needed to enable better remedial policies to be designed.

4. CONCLUDING COMMENT

The route from subsistence agriculture to cash cropping is not an easy one. However, it seems likely that more people will benefit from the change than lose. In any case, it is not possible for any society to prevent the move towards a cash economy, much less return to the traditional subsistence ways.

A number of consequences flow from this. First, it is inevitable that cash incomes and savings, and the goods that cash will buy, will play a more important role in SPIN societies. Second, at least some groups will be made worse off during the change in terms of relative incomes, food security and nutritional status. Third, research is needed to improve understanding of the links between increased cash cropping, subsistence production, incomes, diet, nutritional status and food security. Only through an increased understanding of these mechanisms will it be possible for governments to direct their policy interventions so as to lessen the negative effects of the transition without constraining the positive influences. Meantime, policy

makers need to be more aware of what is already known and understood about the transition and should be alert to the possibility that measures founded on a naive enchantment with self sufficiency are likely to impose high costs on both rural and urban people.

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