

INCREASED PRODUCTIVITY AND COMMERCIALISATION OF NON-ESTATE AGRICULTURE

by

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1. THE BACKGROUND TO THE PROBLEM

This paper provides a critical overview of materials available on the diversification on non-estate agriculture. It attempts to draw out and to weigh the issues that are at stake from a policy standpoint. It sets off from the macro policy context in which the discussion is located. It examines technical and production constraints on diversified crop production, and demand constraints that exist in the domestic market. The main thrust of its argument, however, concerns export marketing. The involvement of experienced commercial firms is emphasised as is the need for a management model that can harness small producers to meet the specialised needs of these export markets. Attention is also drawn to the tension between increased growth and welfare needs of the rural population.

1.1 Why diversify ?

Raising rural incomes, improving the range and availability of domestic foodstuffs, and strengthening the country's balance of payments through the introduction of more diversified cropping patterns has long been recognized in Sri Lanka to be a desirable objective. With the National Agriculture, Food and Nutrition Strategy (NAFNS) of 1984 it gained explicit policy support, and there has since been a discernible spread of concern with crop diversification.

There are different explanations for this upsurge in interest. A common technical view is predicated on impending national self-sufficiency in rice production. Its logic centres on the threat of overproduction (NAFNS 1984). For reasons of quality, Sri Lankan rice is unable to compete effectively in export markets; real returns in the '80s have been stagnant, and when supply eventually exceeds demand producer prices will

fall.¹ It therefore seemed sensible to encourage a shift away from paddy towards other crops - especially if they replaced imports or secured export earnings.

From a strategic standpoint this reasoning has been found wanting on several scores. First, policy has to be more nuanced. Not all land is equally good for paddy, but there remains a need to maintain and enhance productive capacity in staple foods to ensure food security. And, secondly, because shortfalls and surpluses are likely to recur in the best of scenarios - if only because of the unpredictability of weather. The logic of diversification is therefore seen to be a function, not just of rice self-sufficiency, but of the need for a more efficient utilisation of resources in agriculture generally (Jiron 1987; World Bank 1990). As liberalisation and structural adjustment have been embraced, this interpretation has become an increasingly attractive one.

At the highest levels of policy there is also more than economics at stake. The majority of the country's poor (88% in 1986/87 by one estimate) live in rural areas (Edirisinghe 1990). Rural employment creation and rural incomes are a point of political concern. Labour absorption has not been central to technical studies of diversification, but it has become increasingly clear that with traditional patterns of production and productivity rural standards of living cannot be appreciably improved.

Nor are the options confined to diversified agriculture. They entail a spectrum of activities. They include (1) raising the productivity of paddy on land that is most suited to it (and therefore best devoted to paddy in preference to other crops), stimulating the production of (2) subsidiary food crops for the domestic market, (3) tree crops and industrial crops, and (4) non-traditional export crops - all on other lands, (5) encouraging mixed farming and specialised livestock units, and (6) generating non-farm employment through agro-processing and from the higher producer and consumer expenditure that comes with increased incomes. To be meaningful, policies that look to strengthen the rural economy have to weave all these elements into a coherent strategy.

¹ There have been no significant productivity gains since the mid-1980s. In real terms producer prices did not rise at all in the '80s, and 1984 and 1988 saw a substantial dip. Even so, some 400 tons of rice were exported in the first 9 months of 1991.

This paper is nevertheless focussed on crop agriculture, on the non-estate sector, and on non-industrial crops. It examines only one element. It can reasonably be argued that any possibility of helping the peasant sector warrants exploration. But beyond this, sectoral employment rates from the 1980s² suggest that, for unemployment to fall to 1981/82 levels (i.e. to 12%) at the end of 1995 (which is not unreasonable as a policy objective), then from 1990 onwards 300-400,000 new jobs will have had to be created in agriculture. Much will depend on the economy's performance generally, but agriculture has traditionally had to offset disappointingly low rates of employment creation in other sectors. This is not likely to change very dramatically in the short-term. Rural areas are also plagued by high levels of underemployment that have a strong bearing on poverty.

Where, then, is this additional employment to be generated? There seems little prospect of greater labour absorption in the tree-crop sector, at least in the immediate future. Demand for labour could increase in the paddy sector, though it is highly seasonal, and as yet there is no discernible trend to be seen in this direction (Senaka Arachchi 1990). However, prospects of increased agricultural employment, and of higher incomes for workers and for marginal and small producers could improve with more diversification into more labour-intensive, higher-value crops. Thus, for quite a variety of reasons, crop diversification has risen on the policy agenda - as it has elsewhere in Asia.

1.2 Strategic objectives

A point that seems to have been insufficiently stressed in the Sri Lankan literature is that diversification is not new. Mixed cropping has been practiced on upland plots since time immemorial. What is it, then, that is distinctive about the contemporary policy interest? Two features stand out: the priority that is attached to these "other crops" (to crops other than paddy) and the emphasis that is being placed on private sector initiative - on productivity, on commercialisation and on entrepreneurship.

This is consistent with the objectives of the country's structural adjustment programme. With the withdrawal of subsidies, increased reliance on market forces and

² These include rural non-farm activity.

export promotion, agriculture is expected to undergo transformation. Privatisation of estate sector management will be a key development. But, more generally, the aim of policy is to make agriculture as a whole more responsive to market opportunities. The World Bank (1990) has stressed the importance of systemic change, advocating broad-based sectoral investment in a country's capacity for adaptive research, in market information and in infrastructure, and cautioning against setting one's sights on a few quick winners. The aim is not just to move some land out of paddy, it is to inject greater efficiency and flexibility into agriculture as a whole.

In this scenario, specialisation is invoked as an important, if somewhat shadowy mechanism (NAFNS 1984). Given the multiplicity of agroclimates and the varied production base of Sri Lankan agriculture, the relevance of regional specialisation can be readily appreciated. Agroecology obviously has an enormous influence on agronomic potential, and in the end it can provide the competitive edge that makes all the difference. But, in Sri Lankan literature, specialisation has tended to be seen as a concentration of production in particular parts of the country. It can also be seen as a means of increasing efficiency. Specialised commodity systems - beyond a certain critical mass - can generate economies of scale, make possible the provision of more targetted and more efficient supports to producers, and more effective marketing. Second, if individual producers are going to diversify, new crops have also to be workable in the agrarian structure in which these people live and in their established pattern of farming. Diversification needs decentralised adaptive research with respect to local settings. And third, infrastructural and other supports are more easily adjusted and made crop- and area-specific on a regional basis.

Agro-ecological regions with relatively uniform climatic and soil conditions are known in Sri Lanka (see Dimantha 1987). Reservations have been voiced about the longer term significance of some of the crop concentrations that are to be seen today (FAO 1988), and regional variations are not always taken into account in estimating returns from different crops. But elements of specialisation do appear to be emerging. Whether they can offer the advantages of specialisation still remains to be seen. Differences in institutional structure (in the agrarian setting - in holding size, ownership patterns, tenurage security, labour availability, labour relations, indebtedness) have

received much less attention - even though they can have a marked effect on production choices.

What impact this policy can be expected to have on social inequality and on the incidence of rural poverty is also unclear as yet. The view that more dynamism is needed in non-estate agriculture is not controversial. There have also been instances where poor producers have recently benefitted from new cash-crop production. But the extent to which this will occur, and the ramifications of a large-scale shift to commercialised agriculture are still very uncertain. Experience shows that 'trickle-down effects' are not at all automatic, and it suggests that the social impact of this strategy will need to be carefully monitored.

1.3 Policy changes in Sri Lanka

There seems little to be gained by detailing the history of government efforts at crop diversification. This has been documented elsewhere (Agroskills 1983; Jiron 1987). Suffice it to make three points. First, the fact that there has been a long history of government concern is a point that has to be recognised. It is to be found separately with regard to the tree-crop and to the paddy sector, and in a more integrated fashion in the NAFNS. Diversification has been an acknowledged facet of policy for a very long time. The problem has been more a matter of received priority and effective implementation.

In the post-independence period, successive governments have given priority to paddy and have looked to tree-crops for revenue and for export earnings. The agricultural support system was structured to achieve these ends. At some risk of caricature, what followed could be said to have been a string of tunes on one instrument. The first diversification thrust was on uneconomic tea and rubber lands in the mid-country in the late 1960s. It was on tired and degraded lands, and it lacked the resources, support and priority to be at all successful. At the same time, the so-called 'green revolution' of the mid and late 1960s re-emphasised paddy. Output increased;

imports of rice fell, but (as in India and Bangladesh) per capita availability of rice saw a sharp decline.³

In 1971 the United Front Government placed restrictions on imports. In this new situation the cultivation of subsidiary foodcrops (SFCs) acquired considerable impetus. Dietary losses from rice and from pulses, sugar, meat and fish - all of which had been in part imported - were offset by a sharp increase in the per capita availability of vegetables and fruit, roots and tubers and coconuts from domestic sources. Output of these crops increased as a matter of necessity. The government support system for producers, however, was not significantly changed. Efforts have since been made to intercrop in the tree-crop sector; the NAFNS provided a framework in which various initiatives were located, and more recently there has been considerable USAID support for diversification, particularly of irrigated lands in the Mahaweli. There have been advances, but they can almost be said to have been made in spite of a continuity in programme priorities of main state institutions. This would seem to be a second point.

The third point concerns the present macro-economic strategy. Given the significance that import controls had for SFC growth in the 1970s, deregulation could have been expected to have had an adverse influence after 1977. In general this does not appear to have occurred. There was an initial decline in the area under SFCs. There is also some evidence of a shift in consumer preferences away from kurakkan and starchy foods such as manioc and yams towards rice and bread, and of a corresponding decline in the per capita availability of the former crops (CB n.d.:494f; CB 1985:688f; CB 1990:954f; DCS:var.). However, in the case of most crops (maize, green gram, onions and potatoes in particular) the new economic climate would appear to have been favourable. This has been true also for spices and other export crops. For all the institutional bottlenecks, the contemporary policy climate appears to have been conducive to commercial expansion. The central question, then, is whether diversification can be taken further - whether a major push in this direction would be rational and viable, economically and socially, and if so how to accomplish it. This is the central theme of this paper.

³ Average annual imports of rice fell from 550,000 tons over the period 1961-65 to 401,000 tons 1966-70 and then to 326,000 tons 1971-75 (Food Commissioner's Department). Food Balance Sheets record a fall in the per capita calorie availability from rice from 1303 in 1965 to 1208 in 1973.

1.4 Approaches to diversification

Translating broad policy objectives into a meaningful programme of action is a difficult exercise, and different points of entry are almost inevitable. Pethiyagoda & Shand (1990:163f) have observed two approaches in the Sri Lankan experience. One, characterised as primarily production-oriented (in the MADR), has been to stimulate production of traditional SFCs for the domestic market. The other (in the Mahaweli Authority) focussed more on longer-term competitive and comparative advantage in export markets - as a result of which it has come up with crops in which there is much less production experience in any part of the country (*ibid*:187). The two may eventually prove complementary, but this is not quite the same thing as a coherent strategy. Minor export crops (MECs) would seem to have fallen somewhere between the two - being essentially production-oriented though in fact destined for export.

There could also have been other points of entry. The attractiveness of agricultural products for the business community is one area. As we have noted, commercialisation and private sector initiative seem to lie at the core of present policy interest. Ultimately its success will hinge on the perception these people form of the compatibility of specific crops with particular farming systems, of the risks involved, of the relative financial attractiveness of investment in different crops, and - more broadly - of the returns from agricultural products in comparison to those that can be secured from other forms of investment (say, in manufacturing or services). The question as to why - over and above the government's view of what it thinks is desirable - entrepreneurs should put their money into what they (and bankers) often consider to be a high risk business does not always appear as yet to have been broached very thoroughly.

There may also be need to look at the longer-term sustainability of diversified production. One characteristic of Indian discussions on diversification seems to have been much greater concern with cropping systems (Bhalla & Chadha 1983; Hanumantha Rao 1989). It is known that the significance of particular rotations for soil structure and fertility, pests and disease control, and for the overall agro-ecosystem, tends to mount with the rising intensity of agricultural production. Some work has been done in this direction, but there appears to be need for an environmental perspective - leadership in which will probably have to rest on the side of the government.

Moreover, sustainability is not only a long-term concern of the public sector. Many of Sri Lanka's potential export markets are increasingly applying pesticide residue standards and other sanitation controls on imported produce (RAPA 1985; Jansen & Javier 1991). Simply pushing for increased output and for lower costs can not only affect the longer-term sustainability of the production base, it can also undermine the competitiveness that is the aim of the exercise.

There may also be gender implications of diversification. Highland and homestead cultivation of SFCs have traditionally been the domain of women in most parts of Sri Lanka (Wijaya & Jayatilaka 1989). Whether the higher status for these crops - and with it a much greater degree of commercialisation - will give more self-confidence to women (Jayaweera *et al.* 1990) or see a change in the household division of labour and responsibility as men take their tasks over would seem an open question. What a diversification push could imply for female employment and women's control over household resources would seem therefore to be a theme that will need exploring.

2. TECHNICAL POSSIBILITIES

One of the objectives of diversification policy is to increase output and incomes in rural areas, but producers are not equally flexible in their ability or their willingness to experiment. Technical factors play a role, as do agrarian structures, access to inputs, prices and price stability, supports and producer incentives, the reliability of outlets, storage, and producer attitudes. This section looks at some basic technical factors.

From a technical and agronomic standpoint diversification in Sri Lanka is initially constrained by soils and water.

2.1 Soils

Soils are the starting point, though they seem more important in determining areas of potential than as an outright barrier. Paddy is the most suitable crop for cultivation on the red-yellow podzolic soils that cover lower parts of the Wet Zone. Low humic gleys (LHGs) and alluvial soils in the low-lying areas are often poorly drained; they are prone to waterlogging and flooding, and most other crops are too sensitive to

high soil moisture to do well in them - at least in the *maha* (wet) season.⁴ *Maha* incomes therefore tend to depend on paddy, and on productivity increases from the better use of modern inputs, better water control and higher cropping intensities. In the Wet Zone diversification has always been more of an option for *chena* and for homestead plots on the upland soils.

Potential is very much higher on red-brown earths (RBEs) - which are common Dry Zone soils - and on some non-calcic brown soils (NCBs). It can also be high on well-drained LHGs in the *yala*, when precipitation is less.⁵

2.2 Irrigation and water control

The feasibility of higher value crops can also depend on control of water. Diversification into SFCs on a commercial basis has therefore tended to be associated with irrigation schemes where there is much less risk. However, this entails much more than the reliability of supply. IIMI studies have shown it to include problems of drainage; it can require the adoption of alternative forms of land preparation, more intense water management, and an intermittent (rather than continuous) flow of irrigation water. Different irrigation practices are also needed for different crops. These are problems that can be overcome, but at a definite cost - and at a cost that can only in general be borne by fairly specialised production. Storage and canal capacity are less likely to pose problems for irrigation schemes because in general the water requirements of SFCs are less than those of paddy.⁶

It is clear, however, that - as far as diversification is concerned - the ultimate aim is to break the monsoon cycle. It is to provide year-round, on-demand supplies of water that can be controlled to meet the specific requirements of individual crops. Such a system is very much in its infancy in Sri Lanka. The water delivery systems of irrigation

⁴ Production is technically feasible with sub-surface drainage and with surface grading, but this is comparatively expensive. Dimantha (1987) estimated the price at that time at US\$ 1,100 per ha.

⁵ The general pattern has been for paddy to be grown on low-lying land throughout the country. Tree crops dominate higher elevations in the Wet Zone, and minor export crops (principally spices) are produced on small plots (sometimes in home gardens) in the Wet and Intermediate Zones. Food crops are dominant in the Intermediate and Dry Zones, with paddy in low-lying areas and subsidiary foodcrops above the irrigation command area, on well-drained, and on rainfed lands on the upper slopes. SFCs are increasingly found on irrigated paddy lands in the *yala* season.

⁶ However, high performance crops such as chillies and onions do require more water than low performance crops (IIMI 1990).

schemes were primarily designed for flooded cultivation and for rice monoculture.⁷ This, and the practice of puddling that is associated with it, has in the past made these areas unsuitable for other crops. There have been problems of drainage, seepage and high water tables. The farmers' organizations that have evolved have also been found inadequate for the operation, maintenance and management of water supplies for alternative crops at the local (tertiary) level.

However, considerable advances have been made in the up-grading of existing irrigation systems for diversified cropping (Dimantha 1987; Miranda 1989; Panabokke 1989; IIMI 1990; IIMI 1991). And a substantial area is planted with alternative crops in the *yala* season. IIMI studies highlight the importance of irrigation lay-out and land preparation procedures (land shaping, grading and furrowing) that would be compatible with rice and therefore acceptable to small producers - that would facilitate a shift to other crops without destroying the impervious layer built up to minimise percolation losses for their *maha* rice. Attention has also been paid to the possibilities of lift irrigation to feed upland areas.

What this suggests, therefore, is that - technically - water is not a problem on irrigated schemes under proper management (where that is forthcoming). It clearly is a problem in many areas of rainfed production.⁸

2.3 The extent that is available

Judging from the literature, neither soil nor water would seem to be a barrier to diversified agriculture - though they obviously do have a bearing on potential land use. Estimates have also been made of the extent that is potentially available; they give an indication of scale, but they must be examined with caution. Fragmentation and farm size, the difficulty of locating and acquiring land of a viable size for commercial

⁷ Irrigation authorities have long been aware that the best returns to land and water in irrigation schemes would come from growing the most appropriate crops for particular land types. They advocated that irrigated rice (on poorly drained land) and upland crops (on that which was better-drained) be a part of project design. This did not occur, partly because farmers were bent on growing rice and on developing their land into a series of basins (Dimantha 1987).

⁸ Seasonal water supplies, erosion on slopes and lower inherent soil fertility pose other problems on rainfed and marginal rice lands. The one known source of ground water is in sedimentary limestone along the north-western, northern and northeast coast from Puttalam to Mullativu (FAO 1988) - an area of civil disturbance. Little appears to be known of ground water possibilities created by seepage in irrigation systems.

ventures, legal access to land and the terms of tenurage are problems that have yet to be resolved in the promotion of particular crops in quite a number of areas.

Looking first at the estimates, some 60-70,000 has. of well-drained irrigated land seems potentially available for diversified cropping on major irrigation schemes.⁹ Much of this will be highly productive land. At least double this area is thought to be available on minor schemes - though this could include imperfectly drained LHG and alluvial soils that are not very appropriate.¹⁰ Vast extents are said to be available in rainfed areas, though the significance of any such figures is especially hard to accept.¹¹

Moreover, this is not the scale at which land emerges as a problem from a policy standpoint. It is known for example that, for all the area that is potentially available, investors have difficulty in locating suitable land in viable units for specific crops - for temperate cutflowers or fruit orchards at high elevations or for production in proximity to the airport at Katunayake. There are problems of identification, acquisition and land alienation, and there is need for a better categorisation and inventorisation of available lands.

3. PRODUCTION POSSIBILITIES

3.1 The production approach

Planners on the production side have always tended to see diversification as the task of getting a dry season crop when there is insufficient water for cultivation of paddy. It has been a matter of identifying crops which are technically viable in terms of reduced water availability, for which there is known demand, and which are viable in terms of the economic returns from a given category of land. Such options have had to

⁹ The NAFNS (1984) estimated that some 60,000 has. of well-drained irrigated soils being used for paddy could be shifted to other crops. This is broadly confirmed by Dimantha's (1987) estimate of 80,000 has. available in the *yala* season - of which 8,000 has. were already permanently under sugar and 2,000 has. fallow on sugar estates. Access to irrigated land has been facilitated by recent reform of the Agrarian Services Act, enabling wider crop choices. Paddy lands were earlier confined by law to the cultivation of paddy.

¹⁰ Dimantha (1987) estimated some 185,000 has. could be made available for *yala* cultivation under minor schemes. FAO (1988) sees some 120,000 has. potentially available by the year 2000.

¹¹ The NAFSN (1984) suggested an additional 0.93 million has., and the FAO (1988) that 39,000 has. were immediately available. However, in addition to the question of soil types and the reliability of rainfall, there are problems associated with inclusion of *chena* on State lands, problems of physical access, and of land degradation that could result from more intensive production in many of these areas.

fit the smallholder's production system (though the implications of any differences in agrarian structure are not made explicit), and they have had to be seen to be profitable.

Discussion has also tended to be confined to on-farm activities. The input side - not least the availability of suitable seeds and other planting materials - has received less attention. Nor has the discussion taken regional specialisation on board with any particular rigour (despite the fact that it was a key concern of the NAFNS).

Two other considerations could also be considered a part of a production strategy. First, on-farm production possibilities do not have to be confined to agriculture. Thus, while this paper focusses on agriculture, the potential of mixed farming - of livestock as an integral component of a farming system - raises questions of feed efficiency, of green feed, and of the uses of by-products, all of which are relevant for crop rotations and for the potential of crop agriculture.

A second consideration is the envisaged balance between fresh and processed products. Value-added in processing is known to be considerable; on average, the income elasticity of demand in the world market for processed horticultural products has been estimated to be double that of fresh produce (Islam 1990); losses are less, and processing reduces the technical problems between field and market. Progress has already been made in this regard (with the pickling and brining of gherkins for example), but processed produce has been steadily declining as a proportion of fruit and vegetable exports.¹² Processing has therefore to be considered in relation to production potential. What, then, is the context in which all this is to be applied?

3.2 Present production patterns

With present levels of technology - few crops offer a significant financial and managerial advantage over paddy where there is adequate water (see Table 9). For a cultivating household, paddy has the additional advantage of being a subsistence crop (it staves off want), it is well-understood, and it has few marketing problems. With improved levels of technology the situation is different, but faith in paddy makes

¹² The proportion of processed produce fell from 46% of all fruit and vegetable exports by volume 1980-84 to 22% 1985-89. In real value terms it fell from 55% to 38% (Sri Lanka Customs).

diversification an uphill task. Shifting from paddy is often seen - even by marginal producers - to be a risky business (Dimantha 1987; FAO 1988; Panabokke 1989; IIMI 1990). It has proved equally difficult to dispel the view that spice production is only a sideline or a supplementary crop.

Nevertheless, there has - as we have noted - been some success in diversification. The following sections examine these achievements with reference to subsidiary foodcrops (SFCs), minor export crops (MECs) and horticultural crops that are intended for export (including cut flowers and foliage).

3.2.1 Subsidiary foodcrops

Most SFCs are grown under rainfed conditions, though they have become increasingly prominent during *yala* on the Dry Zone irrigation schemes. Most are known to producers, but generally as subsistence crops and as part of mixed cropping, rather than as interplanted crops or as a specialised product. Much of their production is carried out on a miniscule basis.¹³ Data collection is consequently complicated, and macro statistics can be prone to quite considerable errors (APG 1987a). Nevertheless, it is clear that SFCs are planted on 225-250,000 has. a year. It is estimated that in 1990 they accounted for just over half agricultural GDP, and for just under 11% of agricultural exports (Central Bank 1991). Even allowing for errors, there is no doubt about their significance for the national economy.

Tables 1-3 together give an indication of production trends for individual crops. Figures are annual averages for the indicated periods, covering the agricultural years 1972/73-1989/90, and are derived from MADR statistics published by the Central Bank. They provide estimates of area, output and yields respectively. Being averages, they can be influenced by outliers - by an exceptionally good or an exceptionally bad year - and they must be treated with care.¹⁴ Nor do they provide an indication of regional patterns of production.

¹³ See Senanayake (1980:30).

¹⁴ Examples are the unusually good harvest of potatoes in 1975, of red onions in '81 and '82, of chillies in '86 and '88, and of maize in '88, and the particularly bad output of gingelly in '84, and of blackgram, gingelly, kurakkan and soyabeans in 1989. These years influence the average, but they do not significantly change any of the overall trends.

Table 1
Subsidiary Food Crops: the average annual extent
cultivated 1972-89 ('000 has.)

Crop	1972-74	1975-79	1980-84	1985-89
Big Onion	0.2	0.2	0.1	0.5
Black gram	1.7	11.9	15.9	13.2
Chillies	37.1	34.2	28.2	31.3
Green gram	8.4	11.4	22.3	27.8
Maize	34.3	31.2	37.8	40.2
Potatoes	2.5	3.4	6.0	7.4
Red onions	6.6	6.8	8.7	9.4
Soyabeans	0.9	1.3	9.4	5.7
Kurakkan	27.9	21.3	14.8	9.8
Manioc	74.0	51.6	38.6	27.1
Meneri	1.1	1.0	0.9	0.3
Sweet potatoes	2.1	12.1	8.4	6.3
Cowpea	5.9	25.5	35.3	22.7
Gingelly	14.4	25.6	25.6	15.3
Groundnuts	7.2	6.9	11.8	10.0

Source: Compiled from Central Bank, *Annual Report and Review of the Economy*, various years.

However, three crop groupings seem to emerge and can be found in each of these tables. Most crops in the first group - chillies, red onions, groundnuts, green gram, soyabeans, potatoes, big onions and black gram - are high-value crops, especially under irrigation. They all record a steady increase in output. Potato production has expanded particularly fast since the middle of the '80s, as has that of chillies and onions. It can be seen from Table 3, however, that - with the exception of chillies and big onions - there has been no marked increase in yields. Gains seem largely attributable to an increase in area (see Table 1) and to favourable prices. There is evidence of higher yields for individual crops under irrigated conditions (FAO 1988; Gleason, Dinatissa & Tillagalla 1990a).¹⁵

The second group is comprised of kurakkan (finger millet), manioc, meneri and sweet potatoes. All record declining output over the longer-term, a steady decline in the area of production and stagnation or decline in their average yields. This may be a

¹⁵ There are also yield differences between seasons that are hidden by this data.

reflection of consumer preferences, moving away from common coarser foods as more sophisticated options become available - manioc and sweet potatoes being produced almost everywhere except the north and north-east of the island. It may also have meant that producers had more profitable alternatives. Even so, there were still 375,000 metric tonnes of manioc produced a year toward the end of the '80s.¹⁶

The third category - cowpeas, gingelly and groundnuts - record an increase in area and output until the mid-1980s, after which there was a decline. For all three, yields have been stagnant.¹⁷

Table 2
Subsidiary Food Crops: average annual production
1972-89 ('000 metric tonnes)

Crop	1972-74	1975-79	1980-84	1985-89
Big onions	1.1	2.3	1.4	5.8
Black gram	0.7	8.1	8.0	9.7
Chillies	17.9	27.0	26.0	35.1
Green gram	5.1	8.4	16.9	19.4
Maize	24.0	34.9	40.4	44.5
Potatoes	36.2	54.0	77.1	95.3
Red onions	70.7	65.0	67.3	92.8
Soyabeans	0.9	1.5	6.6	6.6
Kurakkan	18.6	17.2	10.1	6.3
Manioc	759.3	504.9	521.9	373.5
Meneri	0.5	0.8	0.7	0.2
Sweet potatoes	n.a	84.2	83.8	49.9
Cowpeas	3.4	18.8	29.4	17.2
Ginegelly	6.2	11.2	14.5	7.5
Groundnuts	8.1	6.8	13.2	11.9

Source: Compiled from Central Bank, *Annual Report*, and *Review of the Economy*, various years.

¹⁶ Some 400 metric tonnes of manioc were exported in the first half of 1991 (DNP 1991:30).

¹⁷ There is also a substantial area under fruits, bananas in particular (estimated at roughly 35,200 has. in 1985).

The picture is therefore mixed. Basically it shows substantial growth in high value crops such as chillies, onions and potatoes, and a decline in traditional rainfed subsistence crops such as manioc, meneri, kurukkan and sweet potato.

Table 3
Subsidiary Food Crops: average annual yields 1972-89
(metric tonnes per hectare)

Crop	1972-74	1975-79	1980-84	1985-89
Big onions	8.4	9.5	10.1	10.2
Black gram	0.5	0.7	0.6	0.7
Chillies	0.5	0.8	0.9	1.1
Green gram	0.6	0.7	0.8	0.7
Maize	0.7	1.1	1.1	1.1
Potatoes	14.3	14.9	12.9	12.9
Red onions	10.8	9.6	9.9	9.3
Soyabeans	1.1	1.2	0.8	1.1
Kurakkan	0.7	0.9	0.7	0.7
Manioc	10.6	10.1	13.9	13.6
Meneri	0.5	0.8	0.9	0.5
Sweet potatoes	10.6	7.2	10.0	7.9
Cowpeas	0.8	0.7	0.9	0.7
Gingelly	0.4	0.6	0.5	0.6
Groundnuts	1.2	1.0	1.1	1.2

Source: Compiled from Central Bank, *Annual Report and Review of the Economy*, various years.

No precise picture can be given of regional specialisation. Table 4 shows the extent to which the production of particular crops has been geographically concentrated. It records districts that accounted for 10% or more of total national production over the 6 agricultural years from 1984/85 to 1989/90. It has been compiled from production data of the Department of Census and Statistics in the ARTI Data Bank. These figures suggest past production patterns, but they are not necessarily indicative of potential specialisation. This is so for two reasons. First, because annual variations are also important and, second, because past areas of concentration have

not always been areas of very high productivity.¹⁸ Nevertheless, they do provide some insight into the overall picture.

Table 4
Subsidiary Food Crops: Regional Concentration of
Production (1984/85 - 1989/90)

Crop	Principal producing districts				Percent
	1st	2nd	3rd	4th	
Big onions	Matale (42%)	Mahaweli (16%)	Jaffna (11%)	-	70
Blackgram	An'pura (40%)	Vavuniya (23%)	Mahaweli (12%)	-	75
Chillies	Mahaweli (25%)	An'pura (12%)	Matale (10%)	-	48
Greengram	Kurunegala (35%)	Moneragala (18%)	Hambantota (10%)	-	61
Maize	An'pura (24%)	Amparai (17%)	Moneragala (15%)	Badulla (15%)	72
Potatoes	Badulla (60%)	N'Elia (38%)	-	-	98
Red onions	Jaffna (44%)	Batticaloa (10%)	-	-	54
Soyabean	An'pura (66%)	Matale (12%)	-	-	78
Kurakkan	An'pura (19%)	Matale (18%)	Moneragala (11%)	-	47
Manioc	Kurunegala (21%)	Batticaloa (10%)	-	-	31
Meneri	Moneragala (30%)	Hambantota (22%)	Ratnapura (16%)	-	68
Sweet Potatoes	Ratnapura (20%)	Kurunegala (14%)	-	-	34
Cowpea	Kurunegala (30%)	An'pura (25%)	Moneragala (14%)	-	56
Gingelly	An'pura (26%)	Kurunegala (25%)	Moneragala (14%)	-	66
Groundnuts	Moneragala (31%)	Amparai (13%)	-	-	44

¹⁸ This is revealed in two ways. First it can be shown that in several cases a district's share of total output over this period was substantially below its share of the area under a given crop (in other cases it was substantially above it). Second, it can be shown that the main producing districts were not necessarily the least-cost districts.

Three points stand out in Table 4 that would seem relevant to a discussion of regional specialisation. First spatial concentration varies considerably from crop to crop (from 98% in the case of potatoes to 31% in that of manioc). Not all production is localised. Secondly, one or two districts comprised a large proportion of total national production of all crops - again with the exception of manioc - though (as we have noted) they were not necessarily producing at above average yields. Third, it will also be seen that the same districts keep recurring (Anuradhapura, Moneragala, Kurunegala, Matale and the Mahaweli). There is need to promote specialisation in the most competitive areas, but what of the others?

3.2.2 Minor export crops

Tables 5 and 6 give an indication of long-term trends in export volumes and real export values of MECs. To minimise fluctuations, these have been averaged over five

Table 5
Minor Export Crops: average annual export
volumes 1970-89 ('000 metric tonnes)

Crop	1970-74	1975-79	1980-84	1985-89
Fruit (*)	-	0.1	6.4	2.3
Coffee	0.3	1.8	2.5	3.0
Pepper	0.7	0.6	1.4	1.8
Cinnamon	5.6	6.0	6.6	7.4
Betel leaves	0.3	0.9	1.7	2.0
Cashew nuts	-	0.1	0.9	0.6
Nutmeg/mace	0.1	0.6	0.3	0.4
Essential oils	-	0.5	0.7	1.4
Vegetables	-	1.7	6.3	4.1
Tobacco	0.6	0.6	0.8	0.6
Cloves	0.3	0.6	1.2	0.8
Cardamoms	0.2	0.2	0.2	0.2
Other oilseed	3.5	1.2	3.6	1.0
Cocoa products	1.3	1.0	0.8	0.6
Arecanuts	-	6.2	3.1	1.0
Papain	0.0	0.0	0.0	0.0
Sesame seeds	-	10.2	10.7	3.5

(*) Fresh or dried.

Fruit and vegetables will be taken up in later sections.

Source: Central Bank, *Review of the Economy* 1979, and *Annual Report* 1990

year periods from 1970-89. In the case of MECs, however, fluctuations in annual output can be very considerable, as can their contribution to agricultural exports.¹⁹ Over the period 1985-90, however, MECs accounted for 10% of agricultural exports and 4.3% of total exports by value (in real terms).²⁰ Almost all production is exported.

Table 6
Minor Export Crops: average annual export
value 1970-90 (SDR million)

Crop	1970-74	1975-79	1980-84	1985-89
Fruit (*)	-	-	0.88	1.31
Coffee	0.21	2.70	5.00	5.22
Pepper	0.62	0.87	1.95	5.30
Cinnamon	5.30	7.83	12.63	14.37
Betelleaves	0.26	0.61	2.58	1.84
Cashew nuts	-	0.21	2.31	3.91
Nutmeg/mace	0.13	0.34	0.43	0.92
Ess. oils	-	1.11	1.87	2.49
Vegetables	-	-	3.23	2.29
Tobacco	0.85	1.12	1.72	1.23
Cloves	0.78	2.93	10.34	2.83
Cardamoms	1.12	1.73	2.19	1.31
Other oilseed	1.21	0.34	1.37	0.46
Cocoa prods.	1.03	2.30	1.18	0.91
Arecanuts	-	1.51	1.61	0.40
Papin	0.14	0.40	0.31	0.10
Sesame seeds	-	4.97	5.02	1.14
All MECs	11.94	29.55	55.99	50.40

(*) Fresh or dried

Fruit and vegetables are taken up in later sections.

Source: Central Bank, *Review of the Economy* 1979, and *Annual Report* 1990

Again, three main groups have been identified - though with more qualification because of the annual variability. Long-term trends have to be seen in comparison with recent annual performances, and these are given for the period 1985-90 in Table 7.

¹⁹ Trends recorded in the literature are consequently very sensitive to the terminal years that are selected. The share of minor export crops in agricultural exports has fluctuated between 12.8% in 1982 and 6.1% in 1984. Since 1988 it has fluctuated around 11% (Central Bank 1991).

²⁰ The latter was down from 5.5% of total exports 1980-84.

The first category - comprising, coffee, pepper, cinnamon, betel, cashewnuts, nutmeg and essential oils - record a long-term trend that seems generally favourable. There has been an upward trend in average real export values and, in the majority of cases, of export volumes.²¹ Amongst them cinnamon - for which Sri Lanka is the world leader - is the major export, averaging almost 30% of the MEC total by value. It has also seen a slow, but rising trend in the average real price received, and export earnings have risen substantially in 1989 and '90. It is, however, under strong competition from a cheaper-priced substitute, cassia. For all these crops average real prices appear to have been rising over the second half of the '80s, though earnings from coffee of late have been disappointing.

Table 7
The Annual Value of MEC Exports 1985-90
(SDR million)

Crop	1985	1986	1987	1988	1989	1990
Fruit (*)	3.00	0.41	1.17	0.65	1.34	0.98
Coffee	10.58	6.84	1.18	5.44	2.05	0.83
Pepper	4.04	4.85	7.50	6.82	3.28	2.17
Cinnamon	11.51	9.97	11.69	15.78	22.91	21.83
Betel leaves	1.60	1.41	1.85	2.35	2.00	1.52
Cashew nuts	14.9	2.76	5.13	4.88	5.24	5.09
Nutmeg/mace	0.48	0.75	0.97	1.39	1.00	0.43
Essential oils	1.66	2.33	2.50	3.17	2.79	1.82
Vegetables	1.91	1.77	1.81	3.55	2.39	5.64
Tobacco	1.45	0.68	0.83	1.48	1.70	2.80
Cloves	1.45	4.92	1.52	5.91	0.35	4.03
Cardamoms	2.74	1.96	0.92	0.51	0.41	0.17
Other oilseed	0.84	0.35	0.36	0.40	0.34	0.09
Cocoa products	2.07	1.04	1.13	0.18	0.13	0.12
Arecanuts	0.40	0.57	0.35	0.38	0.33	1.48
Papain	0.12	0.08	0.12	0.12	0.06	-
Sesame seeds	1.14	0.65	1.64	2.12	0.16	2.43

(*) Fresh or dried

Fruit and vegetables are taken up in later sections.

Source: Central Bank 1991: table 41

²¹ Fruits will be taken up later.

The second group - comprising unmanufactured tobacco, cloves, cardamoms, other oilseeds and cocoa products - are less clear-cut. Taking the longer-term view, average real export values and (with the exception of cocoa which records steady decline) export volumes have been very variable. So have average real prices.²² Tobacco had a particularly good year in 1990, while cardamom and cocoa have seen steadily declining earnings since the middle of the '80s.

The third group - comprised of arecanuts, papain and sesame seeds - have even over the long-term been disappointing. They record a steady decline in both the volumes and real value of exports. In the case of sesame (gingelly) average real prices have seen a steady decline. Areca and papain have fluctuated. However earnings from arecanuts and sesame seed were up in 1990.

It has been estimated that some 35-40,000 has. are under MECs, grown mainly on smallholdings. There is also an observable pattern of spatial concentration in the production of individual crops.²³ They are generally grown in mixed stands at very low levels of productivity. Sri Lanka is said to be notorious for the low quality of many of its MECs.²⁴ A large proportion of stands are senile and require replanting; fertiliser use is extremely low,²⁵ harvesting practices are inadequately followed, and processing units for some crops are said to be dilapidated. It is also generally accepted that extension support for producers is largely inadequate (FAO 1988; ADB 1990).

However, underlying these problems is a lack of commercial orientation amongst the majority of producers. Two points have been highlighted. On the one hand, all these crops (with the possible exception of cocoa and citronella) seem on paper to be viable - coffee, pepper and cinnamon especially so (ADB 1990:vol.II). But they are subject to substantial price variability from year to year, and producers appear

²² Average real prices of have declined in the second half of the '80s for cardamom, cloves and essential oils. The only real gain has been nutmeg.

²³ These are the Central Province for cocoa, coffee, pepper and cardamom; the Southern Province for cinnamon and citronella; Sabaragamuwa for coffee, pepper and cardamom; and Gampaha and Kurunegala Districts for intercropping of coffee and cocoa with coconut (ADB 1990:vol.II annex 4).

²⁴ Average yields are between 25-50% of those obtained under good management - with the yields of most crops at the lower end (ADB 1990:22).

²⁵ On average one tenth of the necessary levels (ADB 1990)

to be particularly sensitive to these variations.²⁶ There must therefore be a question mark regarding the adequacy of price incentives.

A second, more basic problem is the lack of specialisation (whether as monocropping or in a mix of crops). It has been argued that cultivation in larger units (i.e. more than 2 has.) would in most cases generate higher management levels, improved cultivation practices, and consequently higher yields and higher profitability.²⁷ Increasing the scale of production has been a concern of government assistance schemes in the latter half of the '80s (the MECAS III programme) which have offered enhanced rates of subsidy (150%) for larger holdings. Efforts have been made to encourage intercropping in the estate sector. The intercropping of coffee, pepper and cloves with tea has been suggested (ADB 1990). The Ministry of Plantation Industries has also been promoting intercropping of cocoa with coconuts, though with very limited success. Since 1986 subsidy rates have been made comparable to those of tree crops to encourage smallholders to diversify uneconomic tea and rubber lands.

The fundamental problem seems to be one of fostering commercial attitudes and more professional production.

3.2.3 Horticultural export crops

Commodities under this heading are relatively new to Sri Lankan exports. They can be classified into two main categories, namely (a) vegetables and fruit and (b) cut flowers and foliage. The long-term trend in fruit and vegetable exports can be seen from Tables 6 and 7. In 1990 - a particularly good year - the principal exports under the heading were gherkins, capsicum, mushrooms, leeks and potatoes - with a combined value of some Rs 360 million (Central Bank 1991; Customs 1991). Exports of fresh and dried fruits fluctuated violently from year to year, but record growth in average real value.

Table 8 gives the value of floricultural exports 1986-90. It can be seen that live plants and branches and leaves predominate, but that these exports as a whole still

²⁶ When there is a period of sustained low prices there seems to be a tendency to neglect or even abandon their cultivation.

²⁷ Exceptions to this are nutmeg and citronella which do better on a small-scale.

Table 8
Exports of Floricultural Produce by Value 1986-90 (SDR million)

Item	1986	1987	1988	1989	1990
Bulbs, corms & tubers	0.01	0.02	0.01	0.01	0.01
Live plants	1.50	1.97	1.85	1.63	1.83
Cut Flowers	1.04	0.74	0.69	0.81	0.57
Branches & leaves	0.40	0.30	0.68	0.69	1.11
Total	2.94	3.07	3.23	3.14	3.52

Source: Sri Lanka Customs and SDR Exchange rate of the central Bank

comprise a very small category - 0.7% of agricultural exports in 1990 (EDB 1991). The total area involved is extremely small - 170 has. (or the equivalent to one large nursery in Central America). Live plants and cut leaves comprised 75% of these exports by value, and almost all the remainder are cut flowers. Of cut flower exports, 90% are accounted for by one firm. Sri Lanka is the only major producer of carnations in the South Asian region (EDB 1991).

3.3 Financial profitability

Any estimate of the profitability of individual crops must take account of annual fluctuations, of regional variations in production and of production technology. Even changes in the domestic incentive structure (such as the recent removal of the fertiliser subsidy) can redefine the situation quite rapidly. Economic analysis must also be sensitive to gains that can be made by substituting imports with domestic products. Assessing private profitability with an eye on future potential is therefore a complex task, and it is perhaps not surprising that it has led to widely differing conclusions (see Alex *et al.* 1989).

The principal source of basic data that is available for this, as far as SFCs are concerned, are the bulletins on costs of production of the Division of Agricultural Economics of the Department of Agriculture. Table 9 gives a first FAO estimation of the relative attractiveness of SFCs in the agricultural year 1987/88 based on this information. These statistics are dated and will have to be reviewed for more recent years. Nor do they give any indication of variations in yields and in rates of return, which can be quite considerable and which can conceal the potential distributive impact of

diversified cropping. Farm budgets are only available for districts where a crop has been widely grown in a particular season (Jiron 1987), and those in Table 9 are weighted averages designed to minimise sample bias (FAO 1988: working paper 5). The latter poses other problems of interpretation, but the Table does provide an insight into some structural aspects of the problem.

Several points emerge from this table. With the exception of chillies (for which Alex *et al.* found general agreement of potential), nothing compared with irrigated rice in the *maha* season in terms of the return per hectare. Even then returns per man/day for the cultivation of chillies were substantially lower.

As far as other *maha* crops are concerned, the prospects seem unconvincing. In rainfed areas, they all record higher returns per hectare than rainfed paddy - and the difference appears to be enhanced with improved technology. However, rainfed rice on peasant holdings is also a subsistence crop; it is less amenable to substitution, and - with the exception of grams and chillies - returns per man/day may be actually lower.²⁸

In *yala* the situation is different. With the exception of soya and cowpeas, returns per hectare were higher for all these crops than they were for paddy under existing technologies. With improved technology the difference appears to be greater. On the other hand, only red onions - and black gram under improved technology - offered substantially higher returns per man/day than irrigated rice. The implicit price per unit of household labour was therefore lower for these other crops.

The Table suggests that cultivation of SFCs is potentially profitable, especially in the *yala* season and with improved technology. However, these figures do not impute labour costs, and they are averages. They can give no indication of variations in yields and benefits in a given agrarian setting.

²⁸ A somewhat different position has been voiced with regard to System B of the Mahaweli (Gleason *et al.* 1990b).

Table 9
Comparison of the Financial Return of SFCs and Paddy,
1987-88 (in Rs. excluding labour costs)

Season/Crop	Net return per ha.		Net return/man-day	
	Current tech.	Improved tech	Current tech.	Improved tech
MAHA (Irrigated)				
Rice	10,200	-	88	-
(Rainfed)				
Rice	3,200	-	49	-
Chillies	15,900	-	63	77
Green gram	7,700	10,100	50	60
Cowpeas	6,030	9,470	37	49
Groundnuts	5,600	8,400	36	49
Maize	5,550	7,200	40	48
Black gram	4,000	5,900	48	62
Soyabean	3,600	6,300	35	53
Sesame	3,500	4,600	44	51
YALA (Irrigated)				
Rice	9,300	-	87	-
Red onions	77,000	-	102	-
Chillies	28,000	44,900	57	86
Groundnuts	12,300	16,200	51	62
Green gram	11,000	14,000	58	70
Black gram	10,400	14,500	80	100
Soyabean	8,500	10,300	58	64
Cowpeas	7,200	13,100	38	64

Source : FAO 1988:44

This picture is also limited in two other respects. First because, being taken at a point in time, it takes no account of annual variations or of longer-term price trends. And, second, because it takes no account of regional variations in production, or of the competitiveness of this production in international markets or even via-a-vis imports. Table 10 gives an indication of trends in producer prices for SFCs in the 1980s (in real terms). For this exercise the Central Bank's WPI for food has been used as a price deflator.

Table 10a
Index of Producer Prices for Selected SFCs 1980-90 (constant 1980 prices)

Year	WPI	CROP					
		Black-gram	Chillies	Greengram	Potatoes	Red Onions	Ground nuts
1980	100	100	100	100	100	100	100
1985	162	123	99	90	129	207	50
1986	151	167	93	108	163	194	41
1987	180	146	84	79	128	107	40
1988	220	103	98	67	132	134	34
1989	230	160	105	93	125	104	38
1990	280	96	100	80	141	183	39

Source: Basic statistics obtained from the ARTI Data Bank

Table 10b
Index of Producer Prices for Selected SFCs 1980-90 (constant 1980 prices)

Year	Crop						
	Soya	Kurakkan	Manioc	Sweet Potatoes	Gingelly	Cowpea	Paddy
1980	100	100	100	100	100	100	100
1985	96	90	115	104	110	109	81
1986	147	92	118	120	102	133	105
1987	171	71	131	128	51	95	94
1988	162	83	117	120	50	86	81
1989	156	75	120	132	71	108	105
1990	171	104	125	132	64	106	108

Source: Basic statistics obtained from the ARTI Data Bank

These tables suggest that falling real prices over the 1980s would have acted as a disincentive in the case of rainfed crops such as kurakkan, gingelly, green gram and - in particular - groundnuts, and that they would have qualified the profitability shown in Table 9. Similarly, with big onions, real costs of production saw a marked increase over the course of this period.²⁹ Rising real prices are to be observed for soya, potatoes, blackgram and red onions, and these no doubt gave producers an increased incentive.

²⁹ This is based on analysis of cost of production data of the Department of Agriculture for main producer districts and for selected years (ARTI data bank).

Secondly, there is the question of regional variations. Jiron (1987) has shown not only that different districts have a competitive edge in different products, but that the strength of any advantage can vary appreciably.³⁰ This has been taken into account in his comparison of border prices with Colombo supply costs of least-cost districts for selected commodities. This is given as Table 11. It shows that there has been considerable scope for import substitution, that local differences in production costs can be important, and that they are likely to vary significantly from commodity to commodity.

There is also evidence of success in import substitution. In 1990 substantial imports were only recorded for bombay onions (Rs 279 million), masoor dhal (Rs 519 million), coriander seed (Rs. 119 million) and maize (Rs. 234.5 million). Of these, onions are said to have been primarily off-season imports (though this does not always appear to have been the case), masoor dhal and coriander seed have agro-ecological constraints and are not readily grown locally, and maize (which in Sri Lanka is essentially a rainfed *maha* crop) is imported because the animal feed industry needs a reliable supply of quality produce throughout the year.

Most MECs, being perennial crops, do not lend themselves to estimates of profitability in the quite same way as annuals. The task is rendered complicated by the gestation of tree-crops, whether they have been subject to replanting or rehabilitation, and by the age of the plantation. Some of the main problems and characteristics of these crops have nevertheless been alluded to earlier. No comparable data is available with regard to horticultural crops, with the exception of potatoes. In the latter case there was a slow but steady real increase in production costs in the 1980s. Costs of production were consistently lower in Badulla than they were in Nuwara Eliya (CoP data, ARTI Data Bank).

³⁰ This is clearly confirmed by cost of production data of the Department of Agriculture.

Table 11
Comparison of the Border Prices of Selected
OFCs with Domestic Financial Cost of Least Cost Districts
(in US\$ per metric tonne), 1986

Crop	Economic prices	Financial cost: Least-cost producing district		
		1st	2nd	3rd
Blackgram	38`	161	264	-
Groundnut	612	435	531	597
Greengram	373	339	368	(482)
Masoor dhal	472	194	295	325
Maize	168	146	(169)	(170)
Sesame	699	337	345	349

Source: Jiron 1987:62.³¹ Bracketed figures are those above the border price.

3.4 Inputs and costs

The fact that a crop can be shown on paper to be financially profitable - that it is technically viable and that there is a ready market at remunerative prices - does not necessarily mean that it will be an attractive option to the individual producer. Pethiyagoda and Shand (1990:170) have pointed to a series of factors that can be important here - in addition to suitable soils and the control over water. These are labour needs and availability, cash requirements (involving input costs and cash income flows),³² and the required level of technology.

A pertinent point here is that the crops that stand out as attractive in terms of their potential returns shown in Table 9 are precisely those that require high cash outlays on the part of the producer. Cost of production data of the Department of Agriculture (FAO 1988: working paper 5) show that potatoes, red onions, chillies and groundnuts all required significantly higher outlays than paddy in the corresponding

³¹ In order, by crop, these districts were *blackgram* - Anuradhapura, Vavuniya; *shelled groundnuts* - Mullativu, Moneragala, Batticaloa; *green gram* - Kurunegala, Amparai, Matale; for masoor dhal *cowpeas* as substitute - Kurunegala, Moneragala, Hambantota; *maize* - Moneragala, Matale, Badula; sesame - Matale, Kurunegala, Anuradhapura. Comparison with Table 4 will reveal some discrepancies in the case of groundnuts and green gram in particular. This confirms that least-cost districts are not necessarily the main producing districts.

³² They point to capital costs of on-demand micro-irrigation, high recurrent input costs, and to higher costs associated with an increased cropping intensity. Horticultural products usually require more working capital than other crops because they use more current inputs such as fertilisers and pesticides.

season and (rainfed or irrigated) conditions. Outlays of Rs 60-90,000 per ha. for potatoes (markedly higher than those that are applicable in India) or Rs 53,000 per ha. for red onions (Gleason *et al.* 1990a) would clearly be substantial for anyone but the most specialised producer. Moreover, these costs were generally for seed, dressing, fertilisers and agro-chemicals (which require a cash outlay) rather than tractor hire or draught (which a large producer might be able to meet from his own resources).

Added to this are labour needs in production. Thus while irrigated *yala* paddy in the Mahaweli required on average 424 man-days/ha. in 1987, the corresponding figures for red onion, chillies and potatoes (the crops with the highest returns in Table 9) were 758, 503, and 590 man-days/ha. respectively. Groundnuts and green gram were lower at 242 and 188/ha., but all of them were markedly above the 107 man-days/ha. for irrigated Dry Zone paddy outside the Mahaweli (FAO 1988: working paper 5). There have been considerable discrepancies in the estimates of labour requirements (ARTEP 1986:52), but the point seems a valid one. There do appear to be significant differences, implying additional costs or additional labour inputs which - where they were available - can also mean income foregone on other possible activities. There is additional evidence that extra labour is not always available in the Mahaweli (Goldensohn 1990). The availability of technical inputs, including seeds and planting materials, and the vulnerability of many varieties to either pests or disease are other disincentives.

In the case of MECs, costs have been seen to be of less significance than variations in prices - presumably because, under low management levels, costs are likely to be minimal. Even so, it has been observed that, since 1986, rising input costs have been eating into producer subsidies and recommended fertiliser use would require much higher outlays (ADB:1990). The same problems might therefore be expected to apply in making production professional.

3.5 Planting materials

A recurring assumption in Sri Lankan discussions on diversification is that seeds and other planting materials are readily available for the introduction of those varieties that are most viable economically. This is not always the case. The FAO (1988) in

particular has pointed to the insufficient number (or non-availability) of high yielding, and disease and pest resistant varieties of SFCs, and specific shortages are recorded in field reports (Gleason *et al.* 1990a). This puts any diversification drive under a definite handicap from the beginning.

There seem to be four problems: the limited range of varieties and materials that are currently available; quarantine regulations (under the Plant Protection Ordinance of 1981) that prevent or severely hamper commercial imports; the reproduction of certified seed or reproduction by tissue culture; and distribution of these materials to the small producer.

The private sector sees restrictions and quarantine procedures imposed on the import of seeds and planting materials as a severe disincentive on investment in non-traditional agriculture. They find procedures unclear and guidelines subject to arbitrary application by implementing officials. Moreover, there appears to be little evidence of disease being spread in developing countries from certified materials (especially of annuals), and it is doubtful in some cases if testing comparable to that in the country of origin can be carried out in Sri Lanka.³³ As a result, there have been moves to relax restrictions and to allow the private sector free import of mother stock - subject to control and supervision by the Department of Agriculture. Better scrutiny and wider acceptance of phytosanitary certification from internationally recognised sources will also bring Sri Lankan procedures more in line with those of main competitors. There have also been pressures to streamline the inspection and certification of exportable products at site.

The NAFNS (1984:36) and the Crop Agriculture Development Strategy of the (then) Ministry of Agriculture (1984) also stressed the importance of bringing the private sector into the production, import and distribution of seeds and other planting material. Measures to this effect were introduced in the course of 1991. There is also pressure for the private sector to be represented on the National Seeds and Planting Materials Committee (FAO 1991:11). However, seed farms of the Department of Agriculture have in the past been subsidised (losses being met by parliamentary vote at the end of the

³³ Prof. Mohan Ram, Prof. of Botany, University of Delhi - personal communication.

year). This has inhibited private sector involvement because it meant that they had to compete on unequal terms. Establishment of seed growers' associations is currently the subject of an FAO/DANIDA project, but there is need for a national seed policy to resolve these problems.

The resources available for tissue culture would also seem to be at odds with needs of the envisaged strategy of commercialisation. Stronger private sector involvement - as in India and Thailand (which need be neither sophisticated nor skill- or capital-intensive beyond the R & D stage) - also warrants attention.³⁴

3.6 Conclusions

Looking at these patterns, it is clear why there is a certain ambiguity about the definition of potentials. The range of factors and the variation in production and prices, not only from area to area but from year to year raise very complex issues. However, while prices may fluctuate, and real and obvious technical bottlenecks do exist (for example, in irrigation management and in planting materials), they do not in themselves appear to be insurmountable. In many areas technical packages exist, others could immediately be imported, and adaptive research - if it is clearly guided - could make significant inroads. A more serious problem is the stimulus for commercialisation - whether producers and commercial firms will take on these crops. This, however, as we shall see, is not simply a production problem.

4. MARKETS AND MARKETING

The most fundamental problem that will need to be tackled by a diversification strategy is that of marketing. Problems of collection, transport, storage, processing, packaging and distribution are a part of it. This section looks at these problems in relation to four themes: the scope for expansion offered by the domestic market, possibilities of exports to the international market, the organisation of marketing and the need for entrepreneurship and management in commercial marketing activities.

³⁴ See "Copied to Perfection", *Far Eastern Economic Review*, 27 February 1992 p.59.

4.1 The domestic market

In Sri Lanka supply-side policies relating to agriculture assume that the starting point for a diversification strategy should be more efficient production for the domestic market. In the longer-term, it is presumably felt that - as production increases, the product improves and there is more experience in handling - those crops that prove viable will gradually move into export markets. There are quite definite advantages to this line of thinking. It offers those involved the possibility to "learn by doing". And entry into the world market is made at a point when the industry is more competitive and when it is less exposed. There is also a national market to fall back on, helping to cushion fluctuations in demand and prices in the export market.

This is an appealing strategy, but much depends on the size and nature of the domestic market. The problem in Sri Lanka is that the market for SFCs is known to be limited. Their contribution to consumer demand and to caloric intake is extremely low. In 1986/87, for example (the latest data available), tubers, vegetables, pulses, condiments and fruits together comprised little more than 11% of monthly household expenditure (CFSES 1990). This was unchanged from the corresponding survey of 1981/82. Thus, while demand will increase with higher real incomes, the slow growth of income and the low share of SFCs in consumer expenditure together mean that the domestic market will remain small for the foreseeable future.

Given the limited reliability of data on SFCs, it is difficult to be confident about detailed demand projections for individual crops. The MADR (quoted in Pethiyagoda and Shand 1990) made one such estimate in 1987 using income elasticities of demand for specific commodities and average nutritional requirements on the one hand, and trend supply projections to the year 2000 on the other. There are methodological difficulties with this procedure, but the results highlight the problem that underlies any reliance on the domestic market. They are given in Table 12.

What emerges from this analysis is that for most crops - even for chillies which are now highly profitable - the domestic market could quickly be saturated if they were ever to be vigorously promoted in a diversification drive (SRDRG 1988; Shand 1990). Good prospects are envisaged for onions and, in the longer term, for black gram, soyabeans and potatoes. Other crops would only seem viable in the longer-term if they

Table 12
The Anticipated Demand for Subsidiary Food Crops:
percentage surplus (or shortfall)

Crop	1988	1991	1996	2000
Blackgram	6	(17)	(46)	(100)
Chillies	(3)	(6)	(13)	(19)
Cowpeas	47	50	50	46
Greengram	25	25	18	11
Groundnuts	6	10	15	18
Maize	47	36	18	3
Onions	(14)	(26)	(44)	(55)
Potatoes	16	4	(16)	(30)
Sesame	24	22	12	5
Soyabeans	24	8	(19)	(37)

Note : These are medium estimates based on income elasticities in the case of potatoes, chillies, onions, cowpeas and greengram and on nutritional requirements in the case other crops.

Source: MADR (1987), quoted in Pethiyagoda and Shand (1990)

can be exported. These trends are not entirely consistent with the observed production trend of Table 2. However, the thinness of the domestic market and the implicit emphasis on the need for efficiency, lower prices and product quality warrants serious policy attention.

These findings underline the importance of efficiency in order to keep exports open as a possible option, but it also means that any idea of building on domestic market strength before moving into exports will be problematic. For many crops it may be necessary to produce for export from the very beginning. The requirements of importer countries (on criteria such as varieties, crop quality, appearance, presentation and shelf life) are increasingly such that they require specialised production. Exporting when there is surplus is unlikely, under Sri Lankan conditions, to meet contract targets and quality requirements with any consistency.

4.2 Export markets

The income elasticity of demand for vegetables and fruits is known to be higher than that of traditional agricultural exports. However, aggregate import demand of the

industrialised countries is only likely to grow slowly (Islam 1990). The world economy is in recession. An expanding market increases demand, reduces the intensity of competition, and entry tends to be easier. In a depressed international market the reverse is true. The odds are weighted in favour of well-established producers.

Considerable emphasis has therefore to be placed on price elasticities - on product quality, cost reducing innovations and competitive sale price. Attention has also in practice been given to commodities in which Sri Lanka enjoys a long-term competitive and comparative advantage. Pethiyagoda & Shand (1990) give a useful account of the procedure that was followed by the S.R.Daines consultants in identifying markets and crops for the Mahaweli Authority.

The Daines Report saw the basis of Sri Lanka's comparative advantage in its seasonal flexibility, its comparatively low labour costs and its geographical position between major Pacific markets (principally Japan) and those of Europe (SRDRG 1988). There has been some disagreement about the extent to which Sri Lanka's location is an advantage - in that it can also be said to be marginal to both these areas. Moreover, though the situation has been improving, Sri Lanka is not well served by either air or sea freight services (Pethiyagoda & Shand 1990:183).³⁵

Air freight rates from Sri Lanka are relatively high and major airlines focus more on Singapore or Bangkok. Sri Lankan producers can make use of transshipment, but priority in these countries tends to go to their own exporters - who are often also competitors. This is not unimportant because tropical fruit and vegetables are quality sensitive, and the cost of air freight can account for 30-60% of the retail price in European markets. Chosen channels of delivery have to be reliable; systems have to be planned and booked in advance to meet forward contracts, and timely air arrivals are necessary for the coordination of refrigerated freight transport in the importing country.

³⁵ Sea freight charges were earlier controlled by the Freight Bureau. Exporters were not permitted to call for competitive bids from shipping lines or to make their own arrangements. As a result, freight rates were often higher than those of competitors. This seems to have been largely resolved by the decision to liberalise freighting and to adopt an open seas policy (EDB 1991:50).

Other bottlenecks are air terminal cold room space, the seasonal nature of this demand, heavy concentration on west-bound routes, overbooking, inadequate information on the space that is available and flight delays. These problems are common, in varying degrees, in much of south and east Asia. Air Lanka has also begun chartering cargo planes for the export sector (EDB 1991:98).³⁶ However, their policy is in marked contrast to that of the Thai national carrier. Thai Airways has made it a policy that 50% of its outward cargo space is available for perishables at officially subsidised rates (Welsh *et al.* 1991). Promotional rates are available in Sri Lanka for freight by sea, and shipments of cashew, gherkins and live plants have increased considerably (CFB 1990). However, refrigeration conditions, transport time and the volume needed to fill a container are constraining factors.

In addition to all this, non-tariff barriers (phytosanitary and health restrictions, quotas, quality standards, strict labelling and packaging specification, market sophistication, preferences for long-established economic relationships) pose further difficulties of access to these export markets.³⁷

Combining such factors with potential market size, the Daines group classified potential market areas into four groups. The Gulf market was seen to be small, but comparatively easy to enter.³⁸ Singapore, Hong Kong and Australia offered double the market size and also average access. Europe was seen to be a large market with average access, while the Japanese market was large but much more difficult to enter.³⁹

Crop selection was then based on field surveys in these markets for some 16 crops. Criteria for consideration were market demand, transport shelf life, labour

³⁶ The availability of cargo space for cut flowers, fruit and vegetables in particular is a bottleneck that has been aggravated by the fact that many airlines curtailed their air routing via Colombo (EDB 1991:50).

³⁷ Implementing such standards is costly. Regulations are also changed, sometimes abruptly. While Sri Lankan standards have been defined for most MECs, for coffee, for cocoa and for processed fruit and vegetables, little appears to have been done in the area of fresh fruit and vegetables. Limits have been defined for pesticide residues in foods (SLSI 1990).

³⁸ It was also in the mid-'80s one of the fastest growing markets. In 1988 Sri Lanka exported approximately 2,500 metric tons of fruits and vegetables to the Gulf states where the principal market (in both volume and value terms) was Kuwait. The EDB (1990:111) has identified a wider demand for pineapple, mango, papaya, lime, banana, avocado, rambutan, mangosteen and low country type vegetables such as drumsticks, Chinese ginger, green chillies, aubergines and cucurbitaceae.

³⁹ Their priority ranking was West Germany, U.K., Japan, the Gulf/Middle East, Hong Kong and then Singapore.

intensity (a particularly important criterion from an employment standpoint) and technology requirements. Highest priority was given to 14 crops,⁴⁰ with emphasis on table grapes, strawberries, asparagus, pineapples and bananas (with grapes well out in front). These were considered a springboard. They were also, presumably, aimed at a mass (rather than a luxury) market.⁴¹

However, the international market for horticultural products is extremely competitive. A few Asian exporters (Taiwan, and more recently Thailand, Hong Kong, Singapore and the Philippines) account for a substantial share of all Third World exports (Islam 1990). Concentration can be even stronger for individual commodities, and it appears to be increasing. Over the period '83-85, for example, just 4 developing countries accounted for over 70% of Third World grape supplies to the industrialised world; four for over 80% of fresh pineapples; four for over 95% of strawberries (Islam 1990:27). One implication of this is that large competitors have access to specialised techniques and to scale economies that Sri Lanka lacks.

As yet there seems to have been much less consideration of the market potential that could be exploited by Sri Lanka for processed exports.

Turning to MECs, they appear to have suffered from a misguided belief that production rather than export was their principal problem (ADB 1990; EDB 1991:51). On the export side many of the remarks made earlier regarding quality would appear to be applicable, and there are problems in the organisation of marketing that will be taken up later (in section 4.3). There are also increasingly tighter standards to be met in export markets. The American Spice Trade Association has recently adopted tighter standards, as has the EEC as of 1992.⁴² Little information seems to be available on their implications for Sri Lanka.

The EDB has also been promoting the export of cut flowers, orchids and foliage

⁴⁰ In order of priority these were grapes, strawberries, asparagus, pineapples, bananas, mango, melon, shrimps, mushrooms, potted orchids, pepper, cashew, gherkins and tomato.

⁴¹ This is an important point. Exporters tend to concentrate on one grade of product and shifting from one grade to another is generally costly. On the other hand, consumers show increasing discrimination in their choice of foods and with higher incomes they are often willing to pay more for a quality product if it can be supplied (RAPA 1985:8). Choosing the market is not therefore insignificant.

⁴² The International Spice Group has been urging producer countries to take immediate steps to up-grade their standards.

plants to which much of the above applies.⁴³ Export began in the 1970s (with orchids, anthuriums - which are particularly robust - and cut flowers) and it has seen a gradual expansion. The world market for cut flowers increased at 17.3% p.a. 1975-80, 9.2% p.a. 1982-86, and it is expected to grow at 9-10% p.a. over the next five years. Sri Lankan floricultural exports are miniscule in comparison (Rs. 191 million in 1990) and few firms are engaged in them. The principal markets for Sri Lankan products are The Netherlands (its share rising sharply in the middle '80s), Japan, Singapore and the U.A.E. (EDB 1991:86).⁴⁴

4.3 The organisation of marketing

Marketing, as we have noted, has been singled out by many people as a particular bottleneck. However, the nature of the problem involved is not always clearly defined. Substantial losses are believed to occur between the field and the consumer. Marketing is said to be inefficient; it is said to raise the cost of the final product and to act as a disincentive to the individual producer. On the other hand, small producers have been remarkably responsive to higher prices (as in the recent case of gherkins). Greater efficiency seems to be required. But how is it to be realised?

A very general picture can be put together of the present structure of marketing. In the case of SFCs a series of 'marketing zones' have been identified. These reflect the concentration of production in particular regions, and they define areas in which only a relatively narrow mix of crops are marketed in significant quantities. Marketing chains have been traced per zone and per commodity from producer to consumer, noting local, intermediary or Colombo traders that form the various links (Senanayake 1980; Agroskills 1983: technical paper 12). There is no evidence anywhere in this of produce sorting; consumers accept the quality that is usually available, and selection is mainly confined to the retail level. Running counter to the notion of inefficiency in marketing, there is evidence that producers receive a high proportion (even 80%) of the wholesale price of their commodities (*ibidem* - though this does not always tally with the more limited data published by the Central Bank).⁴⁵

⁴³ These were taken up in the first National Export Development Plan 1983-87.

⁴⁴ There is now concern about heavy dependence of Sri Lankan exports on Dutch wholesale markets from which products are re-exported. See also "In the Pink", *Far Eastern Economic Review*, 27 February 1992 p.58.

⁴⁵ The latter suggests quite considerable fluctuation from month to month as well as from year to year.

In the case of MECs, small plots, a scattered production base, and the fact that harvesting is spread over weeks or months means that quantities that enter the market are usually small. This is seen to have hindered the development of a low cost assembly system of any uniform quality, and to have made bulk processing difficult. Marketing arrangements seem similar to those of SFCs - rural traders bulk and sell to a local town buyer, who in turn ships it to assembly traders who are based in Colombo (FAO 1988).

While information of this kind is certainly useful, it is not necessarily an effective approach from a policy standpoint. It has two weaknesses. First, it tends to see marketing as an extension of production rather than as a crucial part of the incentive structure. Second, it often fails to raise the kinds of questions that are determining for the actors. Particularly important in this respect are the organisational arrangements that underlie these structures (farmgate purchases versus *polas*, transport arrangements - including refrigerated transport, package plans, selection and handling arrangements, possibilities for storage, the use of advances and credit, arrangements for sale or for distribution).

The implications of this are twofold. The first is that trade in itself has to be seen as a specialised business with its own requirements. The second is that the producer has to know and to be able to call for the prevailing price for a given quality of produce. It is noteworthy in this regard that the NAFNS (1984:14) recorded a shortage of working capital in agricultural marketing; that there were pressures forcing producers to sell at depressed prices immediately after harvest; and that there was a general shortage of credit available with regard to marketing. Producers' access to market information is also important. The assumption, of course, is that with increasing specialisation and the increasing scale of production and marketing there will be an increase in efficiency. The Agroskills (1983) study notes at one point a shortening of the marketing chain with an increase in scale, presumably associated with an increase in trader specialisation. Whether this can be built into the process is still an open question. Up-grading traditional marketing systems is notoriously difficult.

However, perhaps the most important issue from the standpoint of

contemporary policy interest is how to harness the marketing skills that are necessary to ensure the viability of diversified agriculture over the medium and longer-term. It is to this question that we turn in the following section.

4.4 Entrepreneurship and management

There is no shortage of evidence that Sri Lanka has potential for diversification. The crucial issue is how to realise it and how to guide it effectively. There have been a number of 'success stories' (chillies, gherkins and cut-flowers *inter alia*), but they have been insufficient to signal any transformation of the rural economy. There is a need to foster entrepreneurship and management skills in relation to export agriculture. But there is also tension between the political necessity of maintaining a peasant production base and the needs of an organised industry (with all it implies in terms of commercial suppliers, quality standards, and management skills in marketing and in distribution). There is need to promote initiative, but also a need to safeguard the interests of the small producer.

There have been some suggestions that dynamism could be instilled by attracting people from higher income brackets to move into agriculture (Agroskills Ltd., quoted in Pethiyagoda and Shand 1990:167). There have also been pleas from private sector firms for large-scale holdings. Neither is politically acceptable on the scale that would be required to have a significant impact on agricultural production. As a result, the crux of any discussion of a diversification drive has revolved round the search for a model, or a management style, that can dovetail these different needs in an effective manner.

Attention has tended to focus on the need for entrepreneurship - either as a management unit that can take overall control (the nucleus/outgrower system), as an organising entity (the export promotion village), or simply as a catalyst to production - as a mechanism for developing and demonstrating the commercial viability of new crops and new cultivation practices (Pethiyagoda and Shand 1990). The Department of Export Agriculture (DEA) is also trying to quicken the development of MECs on commercial scale plantations through 'contract farming'. In all these models, emphasis is placed on the control of the production, on mechanisms for the acquisition of

management expertise and technology, and - to a surprisingly less extent - the acquisition of specialised access to export markets.

And yet the logic of this policy is very much tied to export promotion. It is noteworthy that Taiwan, Korea, Hong Kong, Singapore and Thailand are prominent amongst Asian exporters of horticultural produce (Islam 1990). The export strength of these countries is not simply a function of agro-ecological endowments. It reflects their level of development. Their labour productivity, export-related infrastructure and export experience reflect the same organisational and managerial skills that have characterised the expansion of their export manufactures. This is true also of processing. They have built on their reputation as quality exporters, and this has helped them to establish effective contacts with distribution systems in importing countries. This is important because competitiveness is not only a matter of price and quality. It is also a matter of contacts and of sales promotion.⁴⁶

Sri Lanka cannot hope to compete with these countries if it is not also professional. It is generally recognised that, for Sri Lanka, the costs of entering export production are bound to be high, and that the learning process will be long. Substantial promotional effort will be required to overcome consumer preferences for products of established exporters in individual markets (which are often anyway small). The chain from production to distribution will have to be scheduled and controlled for reliability, and experience will be essential in the production, post-harvest handling, transport, and export marketing of perishables (NAFNS 1984; SRDRG 1988; Islam 1990; Jansen & Javier 1991). Considerable investment will also be required on the part of investors to up-grade the industry. All this points to the importance of large and experienced commercial firms.

However, this process cannot simply be 'a formula for growth involving small producers' - though some would argue that if the incentives are right this could be sufficient. It must be more of a partnership. There are three reasons for this. First, given the nature of small peasant production, it is difficult for exporters to work regularly with many individual producers and remain competitive. There is need for more

⁴⁶ Local partners promoting imports are especially important in Japan where the Japan External Trade Organisation (JETRO) has been warning exporters of a definite bias against foreign produce (RAPA 1985:8).

organisation. The Thai case shows that farmers' groups, cooperatives or companies (though difficult at first) aid the development of contracts and the exchange of technical and other information that is commercially important (Welsh *et al.* 1991).⁴⁷

A second reason is that initiative is never a monopoly of large-scale enterprise. It is noteworthy in this respect that in the Mahaweli consultants have been appointed to assist and advise existing and new businesses, and an Entrepreneur Development Training Programme is being carried out in Systems B & C and in Uda Walawe. Though it is early to evaluate these efforts, emphasis is being given to local entrepreneurship. There seems to be an effort to change attitudes and to generate momentum. Moreover, history of the commercial development of horticultural crops in Sri Lanka suggests that large export firms have often come in once the technical viability of production has already been demonstrated. In other words, there has been a two-stage rocket where small entrepreneurs have started a line that was later taken over and expanded when it was proved successful.⁴⁸

The third reason is that a way must be found to safeguard the interests of these small producers. For the industry to flourish, there must be protection against the risks of shifting to new crops, against 'boom and bust' ventures, and against exploitation by over-zealous and less scrupulous businesses. There will also be need for sensitivity to increased inequality in which the majority of the rural poor are simply left behind. However, serious commercialisation has so far only been applied in rather limited areas. Thinking is still in progress and the gains that would accrue from organising producers, or from more interaction between government and producers (and not just government and firms) will have to be taken further.

5. GOVERNMENT SUPPORT

Government support for the diversification of peasant agriculture reflects many

⁴⁷ In the context of export production villages in Sri Lanka this has not been successful and producers' natural distrust of buyers has tended in general to prevail (Jayaweera *et al.* 1991). This might in part be matter of organisational format.

⁴⁸ This may apply even more to developments outside the Mahaweli. However, it warrants study, and it highlights the importance of entrepreneurship. In as far as it is strengthening commercial marketing ventures, the Purchasing Centre Scheme of the Janasaviya may be playing a similar role for the domestic market. As we have noted, however, the information base for work in this area would seem to be particularly limited.

of the difficulties and unclarity that have already been identified. It reveals a certain weakness in focus and in infrastructure (NAFNS 1984; FAO 1991). Two points seem to stand out. First is the need for organisational and managerial reform in the public sector. Second is a need for greater prioritisation - for the concentration of support on crops of greatest economic value, for which there is an identifiable market, in areas where they can compete with paddy or with other activities (NAFNS 1988; FAO 1988). Both these objectives seem to have been complicated by decentralisation to the Provincial Councils.

This section looks more specifically at research, extension, pricing policies, credit and market intelligence. However, it tries to look at them, not in the abstract, but in terms of the support they can offer to the kind of commercialisation push that has been spelled out earlier.

5.1 Research

It is now generally recognised that the strength of Sri Lanka's rice research has left it ill-equipped to provide the necessary support for diversified agriculture. This is reflected both in past research programmes, and in the underlying research infrastructure and research institutions. Agricultural research is widely considered to be in need of reorientation and of a clearer focus.

Attempts have been made to do this through the creation of a Council for Agricultural Research Policy (CARP). This has the authority both to shape national research policies and priorities and to allocate resources. Progress has been made, and adaptive region-specific research has been encouraged. However, the existence of alternative approaches to diversification at national level hardly clarifies the choices as to what is appropriate. Two points seem warranted. First is that it may be necessary to link this research closer with needs of the industry. Second is that there is continuing need for adaptive on-farm research, examining ways of improving the mix and the yields of crops (and livestock) on peasant holdings in the existing agrarian situation of particular areas.

This is a tall order, and it is a task that stretches beyond the borders of normal

agricultural research. It would seem to mean - in addition to varietal development - a multidisciplinary emphasis, a need to redefine and strengthen the link between research and extension, and the link between this and economic research on diversified agriculture. It has been suggested in this regard that CARP is still too strongly influenced by the Department of Agriculture (DoA), and that it should be broadened to include ARTI, the Extension Department and the universities (FAO 1991). It is interesting - in the light of commercialisation thrust that has been indicated - that the private sector would appear to have been consciously excluded.

Efforts have been made to strengthen the research capacity of the DoA to develop technology for SFCs and disseminate its findings. This is being carried out, *inter alia*, under a Diversified Agricultural Research Project (DARP) funded by USAID. Efforts are also being made to encourage R & D activities in the private sector - for example under the auspices of the Mahaweli Enterprise Development Project (on aromatic crops such as coriander, castor and lemon grass).⁴⁹ Less attention appears to have been paid to the possible role of the private sector in importing technology (for example in bananas), or to research on low cost storage devices, post-harvest handling or better packing for transport. All these are crucial for improvements in quality and for reducing losses between farm and market.

With regard to MECs, a sharper research focus would seem equally necessary, though this does not appear to be a principal bottleneck. There has been little research into improved varieties or into technical improvements (such as quicker methods of rooting or better fertiliser formulae) for floriculture - no doubt because of the very small scale on which it is carried out.

5.2 Extension

Extension support appears, not surprisingly, to reflect problems similar to those that are encountered in research. Conventional T & V approaches, where information is spread through a mono-crop farming area by contact farmers, is difficult to gear to the more complex problems of a multi-crop or mixed-farming system. The need for a link with region-specific adaptive research into particular crop-mixes or mixed farming

⁴⁹ The companies involved are Forbes and Walker, Informatics (System C), Mahaweli Farms (Uda Walawe), Richard Pieris (System H) and Sunfrost (System B). *The Island*, 16 December 1991

systems is therefore all too apparent.

Access to research findings in a form that conveys useful information on market situations, varieties, and on current production, packing, storage and other related techniques is obviously a necessary objective. However, it may be necessary to find new and more imaginative means of communication. The use of on-farm trials in connection with farmers' groups may be important here, in cooperation with companies who would be the potential buyers. In the Thai case this has been augmented by seminars and discussions linked to trial shipments abroad (Welsh *et al.* 1991).

In the case of MECs, there is a serious shortage of resources. The number of extension staff has been increasing, but the majority of producers do not appear to have access to extension services, and those that are provided do not seem to be effective (FAO 1988; ADB 1990). Research and extension are also focussed on all growing districts with equal intensity. There would seem scope for more concentration of efforts reflecting comparative advantage.

A World Bank/IDA Agricultural Extension and Adaptive Research Project (AEARP) is examining these problems (and has recently been extended to MECs), but it seems to have been less successful with regard to crops other than rice (FAO 1991). The ADB has provided technical assistance credit *inter alia* for rationalisation of extension.

5.3 Pricing policies

A recent ADB study (1990: vol.2) has estimated the economic impact of government pricing policies (including taxes and subsidies) on returns *inter alia* for SFCs and MECs. Even so, it is difficult to judge how far these policies have supported or weakened diversification efforts. This is partly because of changes in the broader policy environment. However, two general points do emerge. It seems necessary to look not only at individual measures but at the overall package, and to look at this package in relation to production costs over several years.

The most significant change in pricing policy in recent years has been the

removal of the fertiliser subsidy (as of 1 January 1990).⁵⁰ This saw a substantial increase in fertiliser prices. The latter are likely to work their way through into higher sales prices, and in the meantime to see lower fertiliser use and lower productivity. They may also affect the relative attractiveness of paddy compared to SFCs. FAO data (1988: vol 2) suggests that removal of the subsidy may, if anything, have made the task of shifting to high-value crops more difficult, while increasing the relative attractiveness of other SFCs. This is because the fertiliser inputs to high-value crops such as chillies are comparatively high. Cost of production data show that 22% of cash expenditures on inputs in the case of Dry Zone *yala* paddy (including Mahaweli paddy) were on fertiliser prior to removal of the subsidy. The proportion in the case of irrigated chillies and red onions was notably higher (26-30%) and of a much larger outlay. It was significantly lower in the case of black gram, green gram, groundnuts, sesame, and even soya, using existing technology (Working Paper 5). Where fertiliser use was low - as it was generally with MECs - high costs may hinder improvement.⁵¹

The Paddy Marketing Board also operates a floor price scheme in respect to selected SFCs.⁵² As of 1985 this has reflected a 'salvage price' based on the costs of production. How satisfactory these prices are is difficult to assess since the valuation depends heavily on definitions and on the period selected. However, two conclusions would seem valid (ADB 1990). First, that the real floor price has been eroded over time. And second that, when the imputed cost of family labour is included in the calculation, the price for chillies is the only one that has covered total production costs for a sustained period of time (*ibid.*:35f). For all crops the floor prices that were prevailing in 1990 (Central Bank 1991:47) were substantially below the average producer price (as estimated by ARTI). This picture may be misleading in that the bulk of sales are likely to take place immediately after harvesting when prices are low, but it is clear that - with the exception in some years of maize and of soya beans - purchases under the scheme have normally comprised a negligible fraction of total national production (*ibid.*:41; SLBDC 1990:60). With the possible exception of soya, it seems unlikely that the PMB has any influence on prices.

⁵⁰ There has also been a gradual introduction of charges for irrigation water, though that is more difficult to take into account with the data presently available.

⁵¹ Rises in input costs and a consequent reduction in subsidy coverage is noted by the ADB (1990: annex 4).

⁵² A Floor Price Scheme for a limited number of crops was in operation as of 1979, covering maize, sorghum, blackgram, groundnuts, gingelly, chillies and turmeric. This was subsequently extended to green gram, kurakkan and onions.

In the case of MECs the principal line of assistance is on the costs side through the MECAS programme. This provides cash subsidies, planting materials and a limited three year fertiliser subsidy (as of 1990).⁵³ Other subsidy rates were revised upwards in 1986 and can be quite substantial, though the export floor price (introduced in the 1970s) has been gradually withdrawn. It was eventually eliminated in 1987.

The MECAS programme is considered by some to have been a relatively inexpensive means of developing MECs - with the notable exception of its efforts at home garden development which have not been successful (ADB 1990: annex 4). However, several important criticisms must be levelled at it. First, it is said to be focussed too much on producers' needs, with too little concern for its role as an instrument of policy - for pushing production in directions where the country has comparative advantage. Second, it is said to be wasteful. Administrative costs are high, and cash and planting materials are used inefficiently when there is little follow-up and training by means of extension.⁵⁴ Third, it is doubtful whether the cost side alone is the right point of entry, and whether MEC production could not be more effectively stimulated through price supports. It is also felt that there should be more explicit awareness of the external market situation in formulation of policy (FAO 1988; ADB 1990). Overall, what seems to emerge is the need for a master plan, with a clear statement of objectives and of public priorities, and with a coherent overall package of incentives to achieve these ends.

Tax incentives are available for new companies engaged in the export of fruits, vegetables, flowers or foliage plants (as with manufactures).⁵⁵ These are also extended to suppliers of such companies as indirect exporters (Dissanayake 1991). No tax or duty is levied on MECs.

⁵³ Under the Block Demonstration Programme which is designed to promote the use of fertiliser on cinnamon, pepper, coffee and cocoa producers are asked to purchase 50% of their requirements, the balance being given free by the Department of Export Agriculture (DEA).

⁵⁴ Plant survival rates for example are 40-50% which leads to low plant densities and hence low productivity.

⁵⁵ This includes a five year tax holiday on export profits, followed by a further five year's half-tax holiday for concerns with a minimum 25% foreign exchange earnings.

5.4 Credit

The importance of credit for commercial crop development cannot be emphasised too strongly. However, as in other countries, the private banks have been reluctant to move strongly into an area where there is a heavy perceived risk and a high record of defaults. The credit that has been given has consequently been concentrated on established crops (on tree-crops and on paddy), though it appears to have been extended with the increased involvement of the Mahaweli Authority and of established trading houses in agricultural exports.

Over the last five years less than 10% of all credit has gone to agriculture, and over 60% of this has gone to tree-crops and paddy. Over 90% of it has been provided by the two state banks, the People's Bank and the Bank of Ceylon (ADB 1990: annex 7).

The amounts that have been taken up also appear to have been more strongly influenced by the conditions of lending than by the requirements of agriculture. For example, with the withdrawal of the Central Bank credit guarantee in October 1978, lending criteria became more stringent and there was a contraction of credit (a reduction *in nominal terms* of about one third). The result, from the banks' point of view, was a substantial improvement in repayment rates from an average of 51% over the period 1975/76 to 1979/80 to 80% over the period 1980/81 to 1980/84.⁵⁶

In 1986 the credit programme was renamed (to become the New Comprehensive Rural Credit Scheme) with a credit guarantee of 50%. There was a relaxation of criteria and the volume of credit increased from an average of Rs 144 million p.a. over the period 1980/81 to 1984/85 to Rs 431 million over 1985/86 to 1989/90 (Central Bank: *ibid.*). The repayment rate fell slightly to 77% (with a significant improvement in repayment rates of the People's Bank). The refinance rate was 1.5% and the lending rate 9% p.a.

Thus at the time when commercial production of many SFCs was increasing after 1985 and the possibilities for non-traditional agricultural exports were generally

⁵⁶ Improvements incidentally which were largely confined to the Bank of Ceylon (Central Bank 1991: table 90).

stronger, the credit scene was also more favourable. However, two very clear limitations could be seen to be operative. The scale of credit was extremely limited. And it was largely confined to the commercial production of a few high value crops. Potatoes (58%), chillies (27%) and red onions (11%) accounted for almost all the credit from the two state banks to SFCs between 1985/86 and 1989/90 (Central Bank:*ibid.*). Credit provision does not appear to have been adequate. On the other hand, crop and region-specific credit arrangements have been introduced which were not taken up by the private sector.⁵⁷

Three issues appear to be of particular policy relevance in this regard. The first is institutional. It is the absence of a reliable village-level organisation that could assist in assessing an applicant's credit-worthiness, in the supervision of funds, and in ensuring loan recovery. The second, in the absence of effective crop insurance, is the possible role of a stabilisation fund. And the third is interest rate policy. It is argued that while subsidised interest rates are below the inflation rate and below the deposit rate, it is difficult to ensure that they are utilised effectively. A plea has been made for interest at the market rate to channel funds to authentic ventures (ADB 1990).

5.5 Market intelligence

Market information is crucial for success for both producers and traders.⁵⁸ Information is collected *inter alia* by the ARTI, DoA, DEA, EDB and Mahaweli Authority, but it does not appear to be stored and made available as an effective service for private sector users. Most of these agencies undertake publicity work, and television and the press are used as channels of information, but there seems to be a general feeling that this could be substantially improved.

The EDB has stressed the importance of strengthening market promotion and the provision of market information in its four year plan 1990-94. Incentives are to be given to the private sector to set up organisations in major markets along the lines of Japanese Foreign Trading Houses (EDB 1991:76).

⁵⁷ For example, in July 1985 a credit scheme was introduced for the cultivation of chinese ginger, pineapples and passion fruit in Colombo, Gampaha and Kurunegala Districts. Of Rs 32 million provided, only Rs 4.6 million had been utilised by the end of 1989.

⁵⁸ In the case of producers emphasis is placed on price forecasts, information on prevailing prices and on prices by class of produce. In the case of traders it is placed on quantities and location of produce, international prices, and phytosanitary requirements.

Pethiyagoda and Shand (1990) have also pointed to the importance of trade fairs as a litmus test of the acceptability of Sri Lankan produce in export markets. They draw particular attention to ANUGA, the world's largest food fair held biennially in Cologne - which Sri Lanka recently attended. Further gains might accrue from closer linkages with the International Trade Centre, Geneva, and the Asia Pacific Business Centre (which is also in Cologne).

6. EMPLOYMENT AND INCOMES

The welfare implications of a push to diversification and to a greater degree of commercialisation of non-estate agriculture are extremely difficult to assess. This is partly because the studies that have so far been carried out have never explicitly focussed on welfare issues. They have been more technical in nature. Their priority has been growth - instilling needed momentum to the rural areas in which poverty is concentrated. It is also partly because diversified cropping has only as yet been commercially successful in comparatively few areas. An assessment of possible welfare gains is therefore confronted with assumptions that are common, but not all that easy to deal with - that the initial success of pilot projects can be readily replicated, that success under favourable conditions might be relevant to others areas, or that efforts at increasing output might in themselves be sufficient to reduce the incidence of poverty. Experience suggests these are points on which there is need for caution.

One of the main problems is that most case studies refer to developments on irrigated land and to "initial adopters" (whose yields may still be below potential, but who face a relatively stable market).⁵⁹ They tend also to be under the watchful eye of the Mahaweli Authority or of foreign consultants. Under these conditions there is evidence of a substantial improvement in average net incomes and of sharply increased employment. Employment has also been found to be more evenly spread across the agricultural year (Gleason *et al.* 1990a). Devoting even a small area to SFCs is said to provide a surplus that can help the cultivator through a bad year or to repay

⁵⁹ The experience with Chinese ginger and gherkins shows that once it is shown that a commodity can be grown and sold profitably to export firms, there is a mushrooming of producers, oversupply and a collapse in prices. Being in first and having established contracts and institutional support can therefore be important.

old debts (Goldensohn 1990).

It is clear therefore that diversified cropping is capable of raising peasant incomes substantially in certain contexts. But it does not necessarily follow that any gains will be distributed evenly. Variations in yields in a given area can be very substantial, and they are generally higher for SFCs than they are for paddy. For example, in an admittedly small sample of producers in System B - a fairly new area - in *yala* 1990, the percentage standard error in the yields of their most common crops (chillies and big onions - with 28 and 24 producers respectively) were 42% and 48% (Gleason *et al.* 1990a). Though additional employment was generated by SFCs, it was also found that less than 13% went to hired labour, the rest was absorbed by household labour that had been underemployed (*ibid.*:5). The significance of the gains for many cultivating households was no doubt considerable, but it raises questions about the extent to which diversified cropping will help the community as a whole or can generate new jobs.⁶⁰

Such questions seem even more relevant in areas that lack the institutional supports of the Mahaweli and also lack irrigation. These are the areas that contain the worst concentrations of poverty. Understandably - if only because of the higher risks of rainfed production - cultivators in these areas tend to respond to incentives by adjustments in acreage, rather than by trying to improve their product or to increase their yields which would involve higher cash outlays (ARTEP 1986). Their production is then generally confined to the domestic market - which is small. Again, the income gains that accrue may for them be significant but, with low levels of technology, extensive farming and uncertain prices, labour absorption will be low. Expansion of this kind is unlikely to have significant impact on the poverty in these areas.

For many of the poor in rainfed areas, production of SFCs is anyway distress employment. It is an attempt to eke out a meagre existence by whatever means they can. It is significant, therefore, from a welfare standpoint that they are less likely to

⁶⁰ A crude calculation is instructive here. If we assume that the entire 60-70,000 ha. pinpointed as potentially available on major schemes is planted with high-labour crops, how much new employment could be generated? If we assume that on average an extra 200 man/days per ha. are needed over the requirements of paddy and that 75% of the additional labour comes from household members, then (assuming that 200 mandays per year amounts to full-employment) it would produce between 15,000 and 17,500 new jobs.

benefit. It is perhaps indicative of the growth priority of the Sri Lankan debate on diversification options (NAFNS placed little stress on the need to balance growth with equity) that a viable system of rainfed farming (perhaps integrated with livestock) remains as yet an area that is far less explored.

There seems a danger therefore that diversification will remain in essence a growth strategy, that it may reduce the incidence of absolute poverty in certain areas, but will leave inequalities untouched or see large sections of the rural population fall even further behind. This is by no means certain, but there is plainly a need to be realistic about the benefits that can be expected. Much will depend on the management models that are selected and on safeguards the government builds-in to protect peasant producers. In this area, however, there remains much work to be done.

7. CONCLUSIONS

This paper confirms the view that there is scope for greater diversification in Sri Lankan non-estate agriculture. Increased production and improved marketing of SFCs for the domestic market can only be of benefit to both producers and consumers. But the domestic market is limited. Any major drive will have to be focussed on export markets; these are highly competitive, and far more demanding in terms of quality and timing.

A number of technical and attitudinal constraints have been observed that affect the production side. They may be critical in particular cases, but the evidence suggests that - with the right policy support - they are not insurmountable. The key to the problem would appear to be much more in marketing. In the case of the domestic market, entrepreneurship - and with it improved storage, collection, transport and processing, as well as credit for marketing, could help to generate necessary price incentives. For the export market it involves finding an organisational model that can provide the necessary technical support, contacts and experience in export markets, an effective method of organising and up-grading many small producers, and the protection of their interests. Supporting exporters and promoting export production may, however, be the

Seminar on the Year of Export 1992, National Exporters Association, Colombo, 28 November

most effective way of stimulating the desired production response in terms of diversification.

It is much less clear what welfare impact can be expected from these policy priorities. It will in part be positive. But variations in yield, the possibility that most additional employment will accrue to the cultivating household (rather than to hired labour), and the lower policy priority given to rainfed uplands and *chena* areas suggest that reductions in income inequality and the incidence of poverty may not be high. The extent to which this is true has to remain at the moment an open question. There can be no clear assessment. But it does suggest that in the agrarian structures to which policy is applied in different parts of the country should receive more attention.

Thus, while there is potential, there is also the need for an element of realism. The domestic market in Sri Lanka would seem - given the likely rate of real income growth - to be essentially limited. At the same time, export markets for Sri Lanka's products are highly competitive. Production has to be efficient and prices have to be low if the country is going to be able to compete. This means of necessity an emphasis on commercialisation and on increased productivity. There is no clear picture of what this will mean in terms of the distribution of benefits, but - for political reasons at least - there cannot simply be growth. B.H.Farmer (1977) once referred to the "cruel and facile optimism" of the green revolution period. It would be ironic if any degree of unbridled optimism were to haunt policies designed in part to solve the problems which that period created. In the short-term at least there will be definite limits to what can be achieved through diversification.

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