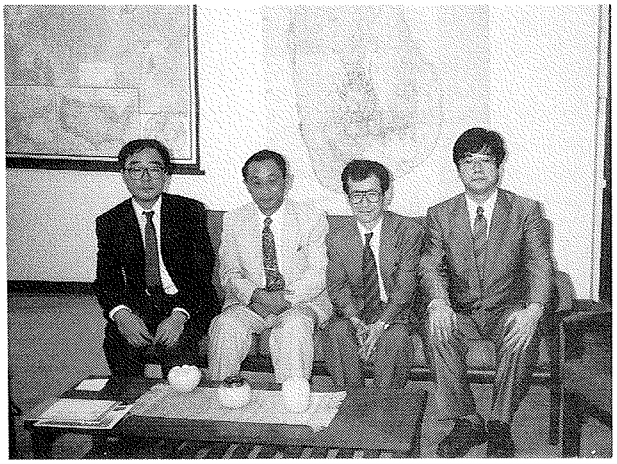
Assigned by the Ministry of Agriculture, Forestry and Fisheries

Report on the Survey of Rural Population and Agricultural Development in Asian Countries

——Sri Lanka——

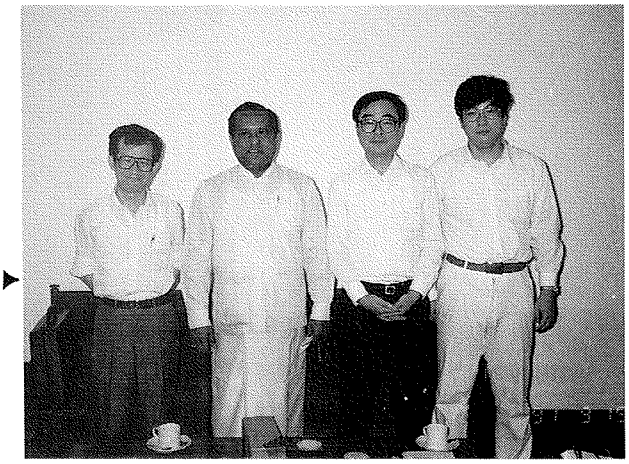
MARCH 1992

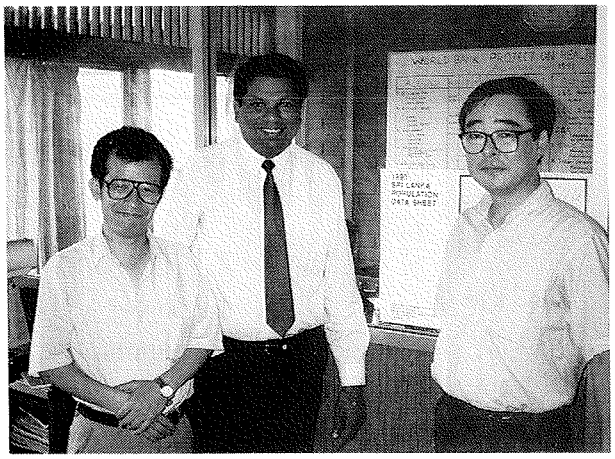
The Asian Population and Development Association



◀ Embassy of Japan.
From the left: Team member Masaaki Endo, Ambassador Isamu Nitta, Research Chief Yonosuke Hara, and team member Osamu Kusumoto.

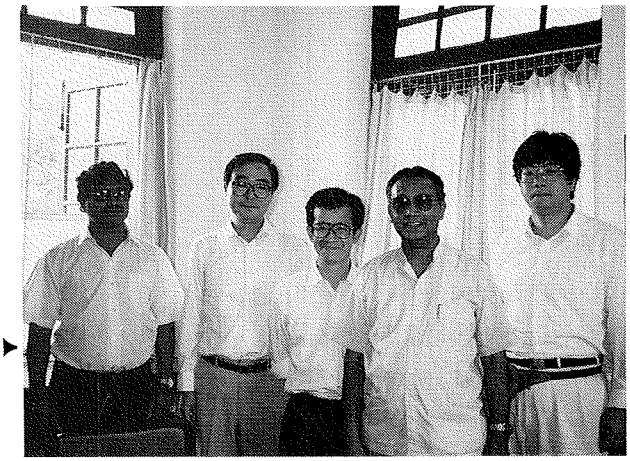
Ministry of Agricultural ▶
Development and Research.
Second from left: Hon.
Dharmadasa Banda, Minister.



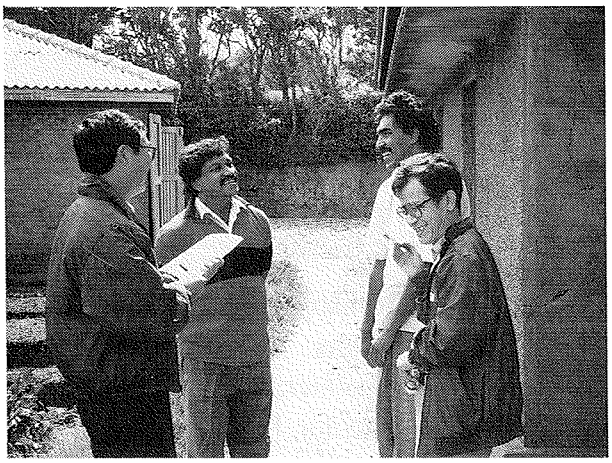


◀ Ministry of Health and Women's Affairs.
At center: A.T.P.L. Abeykoon, Director, Population Div.

◀ Dept. Census and Statistics.
Second from left: A.A.D. Cyril Yasasiri, Director.



Uva Provincial Council. ▶
Second from right: A.B. Talagune, Chief Secretary, Uva Province.



◀ 6-mile Post, Kandapola.
Interview with farmers.

Foreword

The following report represents the results of a "Survey of the Rural Population and Agricultural Development in the Asian Countries," consigned by the Ministry of Agriculture, Forestry and Fisheries in 1991, and entrusted to be implemented by the Asian Population and Development Association (APDA) for Sri Lanka. The survey and compilation of the results were carried out mainly by members of APDA's survey committee (Chairperson: Dr. Shigeto Kawano, Professor Emeritus, the University of Tokyo).

The survey was conducted to pursue the following objective: In Extending cooperation in terms of rural and agricultural development to Asian countries, it is necessary to give due considerations to enhance productivity, to develop rural community, and to improve the standards of rural life. In particular, special note must be taken to assist in sustenance of rural population carrying capacity. For this goal, a field survey will be conducted in a model district selected from among the Asian nations to determine the rural community and agricultural development programs to be implemented, with the objective of maintaining and enhancing the population carrying capacities. The results will establish a guideline for Japan's international cooperation in the area of agriculture, forestry and fisheries.

The field survey in Sri Lanka was conducted with the guidance and cooperation of the Dr. Neville Fernando, member of Parliament and Senior Vice Chairman Sri Lankan Parliamentarians for Population and Development. Also, members of the Japanese Embassy in Sri Lanka Mr. Isamu Nitta, Ambassador, Shin Murakami first Secretary.

In Japan, members of the International Cooperation Division, Economic Affairs Bureau, the Ministry of Agriculture, Forestry and Fisheries, and Aid Policy Divisions, Economic Cooperation Bureau, the Ministry of Foreign Affairs, cooperated in the guidance of the survey substance and arrangement of the field survey. I would like to extend my deepest gratitude to these people.

I sincerely hope that this report would hopefully contribute to the advancement of the rural community and agricultural development programs in Sri Lanka, as well as support the Japanese Government's cooperation there in an effective manner. Furthermore, I would like to note that this report was compiled by and is the sole responsibility of APDA, and does not reflect any views nor policies of the Ministry of Agriculture, Forestry and Fisheries or the Japanese Government.

March, 1992
Fukusaburo Maeda
Acting Chairman
The Asian Population and
Development Association

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Chapter One

Outline

The theme of this report is how to consider the content of cooperation for the agricultural development of Sri Lanka. Of course, Japan already offers cooperation in a number of ways. Aside from financial assistance in various forms, Japan also conducts diverse projects for technical cooperation such as the Mahaveli Agricultural Development Project, and various types of development surveys projects and gratuitous financial cooperation projects. The aim of our survey is not to establish or consider concrete new assistance or cooperation projects, but rather to reflect on what fundamentally necessary and meaningful assistance and cooperation actually consists of.

Naturally, nothing can be built through assistance and cooperation alone. Assistance and cooperation must be accompanied by the self efforts of the beneficiaries. Thus, when considering this issue for a specific country, it is necessary to study what types of problems that country is currently facing, how they are coping with such problems, and if there is a lack of effort on the country's part, what exactly this lack involves.

In the case of Sri Lanka, upon gaining independence after World War II, the first and most basic issue was how to create an economy which could stand on its own two feet, after the distortions it suffered under colonial rule. During colonial times, Sri Lanka exported such "tropical produce" as tea and coconuts, and imported rice and other foods from Thailand, Burma and the Indochina area,

but with independence it was necessary to make great changes to this cyclical structure. Up until now, these changes took the form of strengthening Sri Lanka's own production of rice and other foods, and the rate of self-sufficiency has been greatly improved. Though Sri Lanka still relies to a small extent on imports for such food– as rice and wheat, it can now be considered virtually self-sufficient if we look at current consumption levels.

These improvements were made possible through such policies as the creation of rice paddy fields with the Mahaveli Agricultural Development Project, the reparation of small-scale irrigation facilities, the introduction of improved varieties of rice, and the supply of fertilizers at low prices thanks to subsidies, but naturally these were all possible with foreign assistance and cooperation. Now, the subsidies for fertilizers have been abolished, as will be explained later, and the initial objectives for the creation of rice paddy fields under the Mahaveli Agricultural Development Project have not all been achieved. Furthermore, Sri Lanka still imports rice, though in small amounts, and even more wheat, so the production of rice, wheat and other foods is by no means an issue which no longer needs attention. All the more for the production of livestock, as the demand is expected to increase. In this view, there is still plenty of room for assistance and cooperation in these fields. On this survey, however, we focused mainly on the production of fruits and vegetables, as well as on the strengthening and improvement of their distribution networks.

The reason we focused on the production of fruits and vegetables is that they are protective foods, that is, the rate of increase in their demand is high, not only domestically but also on the international level. In recent years, production of fruits and vegetables has increased, primarily in the wet zones, and foreign exports are increasing, as will be discussed further on. However, there are naturally many problems in their production, distribution and export. If we examine the production statistics for the surveyed region, Peradenia, we can see that the planted area is unstable and the production quantities per 10 ares are noticeably unstable, though this differs depending on the type of vegetable. It remains unclear whether this due to technical reasons or whether production plans vary because of instable markets and prices, but it is probably safe to assume that both these factors are at play. It goes without saying that domestic and international distribution networks and mechanisms greatly influence markets and prices.

We were not able to study problem points with the distribution network for exports, but thanks to local cooperation we were able to follow the route from farms to wholesalers, from wholesalers to retailers, and thus study the distribution network on the domestic market and the price formation mechanism to a certain extent.

The key issues for the production of fruits and vegetables are first of all the establishment of the appropriate cultivating land conditions, the development and diffusion of excellent varieties, and improvements to production management techniques. Next, it is also necessary to establish production plans which are in keeping with demand, and thus to acquire accurate information and take the proper decisions to make this possible. Furthermore, for sales and exports, improvements to packaging, transportation and storage technologies, the establishment of a competitive distribution order, and the installation of information networks and roads and waterways for transportation are required. Thus a wide range of fields is involved, and assistance and cooperation for these improvements must therefore be diverse.

The survey report which follows includes the ten requests made by the Badulla district to the central government concerning agricultural development, and these indicate this diversity. These requests cover all agricultural processes, from seeds to water, agricultural tools, guidance for diffusion, sales and storage.

If we return to the origin of production, we see that the essential issue is what actions producers should take in the future, and how producers can make demands for assistance and cooperation resourcefully and whether or not they can use them advantageously on their own. Happily, under the socialist system the level of education of producers in Sri Lanka appears to be higher than in other developing countries. It is necessary to distinguish between what the government should do systematically in the form of public investment and what producers should do themselves, and to handle these differently. Whether or not prescriptions for assistance and cooperation are put to truly effective use depends on whether or not producers have the proper awareness and a resourceful attitude. Even so, in the end the thorough education of producers, their organization and the creation and advancement of cooperative organizations for this are essential. This should always be kept in mind when considering assistance and cooperation.

Chapter Two

General View of the Agricultural Economy

1 The Importance of Agriculture in the National Economy

In Sri Lanka, the share of the agricultural sector in the gross domestic product was 26.3% in 1990 (see Table 1), while the percentage of all those employed in agriculture was a little lower than 50% of total employment. Thus, agriculture is not supremely important for the share in the gross domestic product, but if we consider the fact that the share of manufacturing, which is as important as agriculture among direct production activities, was still less than 15% (see Table 1), there is no doubt that agriculture is decisively important in the Sri Lankan economy. In addition, agriculture is still the most important economic activity from the point of offering employment opportunities to the Sri Lankan people.

When considering the long-term growth of the domestic economy of Sri Lanka, it is important to note that there have been no remarkable changes in the economic structure from the 1980s on. The share of agriculture within the gross domestic product was 28% in 1980, and only decreased 2% over

the decade. If we look at the employment structure as well, the share of those working in agriculture only decreased from 53% in 1980 to 48% in 1990. There is no doubt that the gross domestic product and the real economic growth rate of the agricultural sector accelerated with the liberalization of the economy in 1977 in comparison to the previous period of the planned economy which stressed welfare. However, the growth of the manufacturing sector, either import-subsituting or export-oriented one did not accelerate too much, and the national economy as a whole has not yet shown very conspicuous structural changes.

The most distinctive element about agriculture in Sri Lanka is the two-layered structure of production. This consists of the coexistence of the plantation sector, producing such export crops as tea and rubber, which was developed during colonial times, and the small farm sector which produces rice, vegetables and other foods for domestic consumption.

It is well known that since the colonial period the Sri Lankan economy has been based on the export of tea and rubber. In addition coconut plantation has been growing since the 1970s. The importance of the goods produced by these plantations is still extremely great in exports from Sri Lanka. Currently, tea and rubber plantations, the most important for Sri Lanka, are controlled and managed by two public organizations, the Janatha Estates Development Board and the State Plantation Corporation. The tea and rubber plantations were put under public management with the intent of securing the economic profits from the export of plantations crops as government's revenue. These two large public corporations employ some 400,000 people and are at the center of the Sri Lankan governmental corporations.

Another core of agriculture in Sri Lanka is small-farmer's agriculture. On the land stretching from the dry zones through the intermediate zones and on the wet zones, approximately 1,800,000 households run family farms. Some 43% of these are small-scale farmers working plots of one acre or less. The major crops are rice, the staple food of the Sri Lankan people, as well as vegetables and miscellaneous cereals. It is also important to note that these small farmers produce such export goods as tea and rubber. The share of land covered by the small farms among all land in Sri Lanka producing these export goods is 28% for tea, 70% for rubber, and as much as 90% for coconuts. Thus, in addition to rice, cereals and vegetables, the production of these export products is also important for

small-farmer's agriculture.

Now we will briefly discuss the development of agriculture in Sri Lanka, focusing primarily on small-scale farming.

After independence in 1958, the Paddy Land Act was established. The purpose was to stabilize tenant rights and decrease the share rent of tenants from 1/2 to 1/4. However, even today the establishment of this tenant law has had little effect, and the "Ande" system of share-tenancy is still widely in place. Furthermore, in 1972 the Land Reform Law was enacted, setting the maximum paddy area which an individual can own at 10 hectares, but this Land Reform Law does not seem to have been implemented completely.

The spread of the technological innovation such as high-yield varieties of wet-land rice with the expansion of irrigation facilities was more important for the development and modernization of small-scale farming in Sri Lanka than the above institutional reforms. From the 1950s on, water resources were developed mainly in the dry zones. The typical examples are the Gal Oya Development Project, the Uda Walawei Reservoir Plan, and the Mahaveli Ganga Development Project. This development of water resources increased the amount of irrigatable land in the dry zones, and the area of irrigated paddies in both the Maha and Yala seasons has increased at a considerably fast pace (see Table 3). Furthermore, the use of high-yielding rice seed and fertilizers is also increasing as the result of the expansion of irrigation facilities (see Table 4).

For the cultivation of rice, the core of small-scale agriculture, it is significant that such technological innovations have brought about agricultural growth, but it is important not to lose sight of the fact that there are still many traditional systems in place in farming villages which hamper agricultural development. One is the "Thattumaru" system of land inheritance. According to this custom, ownership rights are divided not by partitioning the land but by dividing the rights to use it into different periods of time. This prevents the size of land owned or managed from becoming so small as to become uneconomical, but on the other hand intensifies the problem that managers lose the motivation to make long-term agricultural improvement investments, since the time the land can be used is limited. Another such tradition is the "Kattimaru" system, a custom by which co-owners possess scraps of land alternately, and this hampers long-term agricultural improvement investments (B.L.C.

Johnson et. al., Sri Lanka: Land, People and Economy, Heinemann Educational Books, 1981).

If we take Sri Lanka as a whole, the cultivated land area per person is an extremely low 0.14 hectares, so the central issue for the development of agriculture in Sri Lanka is to improve of the productivity of small-scale farming. To do this, it is no doubt essential not only to increase irrigation facilities and introduce high-yielding seeds, but also to reform the rural institutions, targeting the land-tenure systems and other related institutions in farming villages.

Here, let us look at the consumption of different articles of food per person in 1990, shown on the food supply and demand tables, in order to clarify the importance of small-scale agriculture in Sri Lanka.

The consumption of polished rice per person was 101.45 kg, while that of flour was 27.62 kg. 8% of the rice consumed was imported, while all the flour was imported. As stated above, with the technological innovations in rice production, the domestic rice yield is increasing in both the Maha and Yala seasons (see Table 5), but cannot keep up to the increase in domestic demand due to population growth and other factors, so Sri Lanka is still dependent on imported rice (see Table 6.)

The per capita consumption of vegetables was 32.9 kg, and the per capita consumption of fruits was 2.7 kg. All these vegetables and fruits are produced domestically. The per capita consumption of eggs was 3.6 kg, all of which is also produced domestically. The consumption of milk was 8.3 kg, of which 20% was imported milk powder. Thus it is clear that for the supply of these foods, other than rice, the domestic small-scale agriculture plays an important role (see Tables 7 and 8).

As a result of the per capita consumption of the foods listed above, the per capita energy intake in Sri Lanka is approximately 2,250 calories per day (see Table 9).

2 Trends in Agricultural Policy Under Economic Reform

Currently, the government of Sri Lanka is implementing vast reforms of its domestic economic policies, and agricultural policies are also undergoing fairly fundamental reforms. The basic direction of these reforms, to state it simply, is the more active use of the market mechanism. When

considering strategies for developing Sri Lankan agriculture in the future, this point will no doubt be decisively important.

The economic reforms which the Sri Lankan government is carrying out today is targeting basically to the further promotion of the economic liberalization which began in 1977. Sri Lanka had implemented active economic development plans after political independence. These developmental plans relied on the guidance of the government and public sectors, and stressed the welfare of the people. Revenue from exports was quite high due to the existence of the tea, rubber and other plantations formed during colonial years, and the per capita income in Sri Lanka was relatively high in comparison to other Asian countries, so the government adopted developmental plans stressing improvements to nutrition and health and increases in the education level of the people. As a result, the nutritional and health conditions and rates of advancement to higher education have reached relatively high levels in the developing Asia, and the average life expectancy in Sri Lanka is the highest in the developing Asia. While such good results were achieved as seen from welfare indices, this was basically supported through government expenditure gained through the export of the plantation crops. It became rather clear in the mid-1970s that Sri Lanka could not continue this kind of government-sponsored welfare policy. Because of such measures as putting the plantations under public management, the economic efficiency of plantation dropped, and then exports of plantation crops were stagnated, and it became difficult to persevere the strategy of economic development stressing welfare.

Thus, in 1977, the National Party which had newly taken power implemented a switch in the economic development strategy, from a developmental strategy stressing welfare to one for improving production efficiency. In concrete terms, this consisted mainly in policies to encourage export-oriented industry in the private sector, and the activities of foreign companies, which had previously been severely restricted, were liberalized. A typical example of this is the establishment of the Free Trade and Processing Zone in Colombo.

With the adoption of such economic liberalization strategies, Sri Lankan domestic production activities were vitalized, and the economic growth rate did rise in comparison to before. The real economic growth rate was 3.1% from 1970 to 1977, but increased to 5.5% from 1977 to 1985. Thus,

it is safe to say that the economic liberalization policies were effective.

However, the problems accumulated in Sri Lanka within the strategy of development placing emphasis on welfare had not be sufficiently resolved. In particular, the problems of the excessive size of the public sector and its inefficient management had remained insufficiently resolved. Even after 1977, deficits of government's budget continued to increase. Fiscal expenditures, including subsidies for the ineffective governmental enterprises and the public sector, were greater, and the fiscal deficit was growing. The government's domestic borrowing was increasing, resulting in a rise in domestic interest rates, and adversely affecting the capital usage situation of the private sector, thereby hampering its economic activities. In addition, borrowing from abroad was also increasing, and the trend of the debt-accumulation was becoming increasingly pronounced. Furthermore, exports had decreased because of the drop in primary good prices on the international market in the mid 1980s, and the economic growth rate decreased.

With this situation, the Sri Lankan government began another attempt to restructure the domestic economic structure in 1989. In 1985, due to the fact that the foreign reserve decreased abruptly and the deficit in the balance of payments grew, Sri Lanka made a request of structural adjustment loan to the World Bank. Then, Sri Lankan government began a series of structural adjustment policies. First, in November of 1986, it announced a reduction in public expenditures and the adoption of a flexible interest rate policy, then in 1989 it took stabilization measures to devaluate the exchange rate from 35 to 40 rupees to the dollar, and also implemented rationalization measures for the public sector, such as postponing implementation of some poverty programs and raising the price of wheat. The structural adjustment policies currently being implemented by the government of Sri Lanka include everything from macroeconomic stabilization policies such as devaluating the exchange rate, reductions or suspensions of inefficient public investments and subsidies, and the privatization of ineffective government run public enterprises. Here we will place our focus on agricultural policies, the main theme of this report.

Within the overall structural adjustment of the domestic economy, the fundamental policy for agriculture also switched from the strategy consisting mainly of increasing rice production as import substitution to the diversification of agriculture, including the promotion of high value added export

products. For this, rationalization has began in various aspects of the public sectors concerning the agricultural sector.

First, the plantation industries. The government is now considering rationalization of the management of the two large public corporations. It is considering to handle the management to the private sectors while keeping the ownership of the plantations in the hands of the government. The dismemberment of these two corporations is also being studied.

Quite extensive changes have already been made in the systems related to small-scale farmers.

First, the change in the domestic rice distribution mechanism. The functions of the Paddy Marketing Board, the public organ which in the past handled the domestic distribution of rice, have been heavily curtailed. In 1972, this Board handled 42% of the total domestic demand, but in 1991 it only handled some 4%. The functions of this Board have truly been reduced to that of a "small-scale purchaser of last resort". Some two thirds of the Board's employees have been transferred to other functions. Most of the warehouses and rice milling facilities owned by the Board have been sold to the private sector.

Second, the relaxing of restrictions on and the privatization of the fertilizer distribution mechanism, and the abolition of fertilizer subsidies. The import and domestic distribution of fertilizers is now basically in the hands of the private sector, while the government-expenditures on fertilizer subsidies, which had formed a major portion of all national subsidies, were stopped as of the beginning of 1990.

Third, the reduction and rationalization of food subsidy expenditures. Food assistance to the poor in Sri Lanka had been a central point of the economic policy stressing welfare which was adopted after independence, but such expenditures have been reduced and rationalized. There are three types of food assistance, the food stamp program, the mid-day meal program and the Jana Saviya Program. As of 1990, measures to reduce and rationalize these programs were taken, and the total subsidies for the sum of these three programs is now limited to a maximum of 3.5% of the GNP. The food stamp program distributes food stamps to 1,800,000 households which have a monthly income less than 300 rupees, covering roughly half of the total population. The mid-day meal program is a system by which the government gives lunches at elementary and middle schools. The Jana Saviya Program

pays 2,500 rupees per month over two years to the households which receive food stamps and households which have a monthly income less than 700 rupees, of which 1,042 rupees must be compulsorily saved as future investment funds for the household.

Finally another point which requires attention is the reduction of public investments in irrigation, which had been a central focus of the agricultural development policy from 1950 on. In the past, massive sums of public funds were invested in building large-scale irrigation facilities. Now, such large-scale public investments will no longer be made, at least for the time being. Rather, the government has adopted the strategy of placing emphasis on the repair of existing facilities. It is also considering a proposal for having farmers cover 10% of such repair costs.

The government hopes that if investments in new irrigation facilities become profitable, these will take the form of private investments to build new tube wells. It seems to be rather clear, behind the decision to adopt this policy there exists the judgment that, considering the current situation of the international rice market, there is no need to aim at achieving complete self-dependency for rice, and that relying partially on imports to cover a portion of the domestic consumption is more economical.

But how will these changes in agricultural policy affect agricultural development in Sri Lanka? It is the rather new phenomenon that the agriculture policy changes were effected, so it is still too early to judge their effects based on observed facts. However, these changes are almost certain to have the following effects:

First, the effect on the production of rice. It is very possible that the increasing trend of fertilizer-use which had supported increased rice production in irrigated land in the past will not be continued due to the stoppage of fertilizer subsidy expenditures. While the cost which farmers must pay for fertilizers is increasing substantially due to the stoppage of fertilizer subsidy expenditures, there is little possibility that the price of paddy will rise, considering the fact that market intervention of the public Paddy Marketing Board has virtually stopped. Thus, there is no doubt that the economic profitability of rice production is dropping. The goal of import substitution for achieving complete self-sustenance for rice has in fact been suspended.

Second, we can expect a strong positive influence on the production of agricultural products other than rice, and in particular products for export. There is no doubt that the economic profitability of

producing agricultural goods for export has increased substantially, mainly due to the devaluation of Sri Lanka Rupee. The fact that the production of vegetables and fruits for export in the wet zones has begun to increase very recently shows tangibly that devaluation of the exchange rate has had a major effect. If the private sector takes over management of the plantations, Sri Lankan exports of plantation crops will become more competitive.

Thus, we can say that the reforms to agricultural policies within the structural adjustment policies of the domestic economy as a whole are acting to promote the conversion of agricultural development from increasing rice production towards diversification of agriculture.

3 The Market Economy Situation Faced by Small-scale Family Farmers

In Sri Lanka, the basic agricultural development situation is now switching from an import substitution type focussing on increasing rice production towards the diversification of agriculture. It is no doubt that one of the major issues for this agricultural diversification is to reactivate the plantation sector through improvements of management and productivity, but it is more important to achieve a diversification of management at the level of small-scale family farms. It is clear that agricultural development through diversification of agricultural management is decisively important for further improving of the standard of living of rural people, which make up roughly half the population of Sri Lanka.

In particular, in order to change slash-and-burn (chena) farming, which is traditional in the dry zones, to the more permanent dry farming, it is necessary to foster the production of products for the urban markets and for export.

The stabilization of rice production through the repair and spread of irrigation facilities is necessary in order to improve the management of family farms, but diversification of management through the introduction of products other than paddy rice is more important. This is especially clear for small-scale family-run farms in the wet zones. The very fact that the production of vegetables and

fruits for the Middle East, Europe and Australia began and grew in the latter half of the 1980s is a typical example of one of the movements of agricultural diversification. In 1990, the sum of exports of such vegetables and fruits reached the million dollar level. This is negligible in comparison to the sum of exports of crops grown on the plantations, but deserves attention because it suggests the direction in which Sri Lankan agricultural development is moving.

As previously stated, with the recent changes in agricultural policy, the responsibility of agricultural development is increasingly be left to the free decision-making of farmers themselves and the free activities of merchants, instead of rigid planning and guidance by the national and public sector. Put bluntly, this is a strategy of agricultural development which actively uses the market mechanism. Thus, the major issue which will be facing agricultural development in Sri Lanka is how to realize improvements and diversification of the management capability of small-scale family farms under the market economy mechanism. Naturally there will be fierce economic competition under a market economy, so it is of urgent necessity that small family farmers acquire the management capabilities to endure such economic competition, though this is no easy matter. This will be the major issue for agriculture in Sri Lanka in the near future.

The improvement and diversification of farm management is technically quite feasible, not only in wet zones where there are steady rains throughout the year, but also in dry zones in which irrigation is possible using pumps and tube wells, thanks to the abundance of ground water. Because of this, improvements of the market economy conditions which face family farmers are the most important issue. As a premise for considering measures to make these improvements, we will now consider the current situation of the distribution market for agricultural products and the financial market, among the many markets which the farmers must deal with.

First, an issue of decisive importance for the improvement of the management of small-scale farms, which are scattered over regions with diverse ecosystems, from wet to dry zones, is to create a marketing mechanism which links these scattered family farms to the urban and in turn the export market. Now we will observe the situation of the distribution mechanism for agricultural goods produced by farmers, taking wet zone vegetables as an example. Our source is a document called "An Assessment of Causes for Vegetable Price Increase and Solutions", conducted by the Depart-

ment of Agriculture of Kandy District. As previously touched upon, the intervention of the nation and public sectors on product markets, including rice, is decreasing, so the distribution of agricultural goods is increasing being left to the free activities of the private sector. Thus, it is important to understand the current situation of the vegetable distribution mechanism in order to discover the problems which can arise during this process.

The vegetable distribution mechanism basically consists of two routes, one from the farms to the wholesale markets in the cities, the other from the wholesale markets to the retail markets and then to consumers. First, the distribution from the producers at the site of production to wholesale markets in such cities as Colombo and Kandy is handled by private businesses called transport agents. These private dealers own trucks and other transportation machines, collect produce from producers, take a commission and transport the vegetables to the wholesale markets in the cities.

The most common method by which these dealers collect vegetables from individual producers is to do so in person from each farmer individually. In order to ensure that they can purchase the desired amount, these dealers usually give the farmers credit. Thus we can say that the credit market and produce market are interlinked. Aside from these dyadic transactions, in some cases farmers assemble at one place in a village and many dealers come there to purchase or procure vegetables, and in some cases smaller village collectors make rounds of farms to procure vegetables, which are then purchased by transport agents. The transport agents transport the vegetables which have been procured in one of these ways to the wholesale markets in cities, then pay the producers at a later date the price decided on at the city markets, from which commissions and transport costs have been subtracted. This is the basic pattern by which vegetables flow from the producing farmers to the wholesale markets in cities.

The first point which should be noted here is that the prices of vegetables on a certain day are basically determined according to the supply and demand conditions at the wholesale markets in cities. Thus we can say that the market price of vegetables is determined competitively at this level. Secondly, the producing farmers have no way of acquiring information on what the prices of the vegetables they shipped out were at the wholesale markets in the cities, other than what the transport agents tell them at a later date. Thus it could be a major problem if the number of transport agents in

a certain region is limited and they tend to monopolize the trade.

Many retailers come to purchase vegetables at the wholesale markets, and produce then flows from retailers to consumers. One major problem regarding the flow of vegetables from the wholesale markets to consumers is that the distribution loss in this process is extremely high. The major causes of these distribution losses are that distribution is by no means systematized, and the fact that there is a lack of facilities for keeping the vegetables refrigerated.

Table 10 shows the example of the price differences at the three stages for vegetables shipped to the Colombo Market, based on the Assessment mentioned previously. We can see that the increase in price from the wholesale to the retail stages is great. This basically indicates a major problem in the distribution mechanism from the wholesale to the retail market.

The extent of the losses for the distribution of domestic agricultural products as a whole is not very clear, but based on the food supply and demand tables for 1990, we can make the following conclusions. Losses are only about 7% for the distribution of rice, but extremely high for such foods as vegetables and fish. For onions, losses were approximately one half of the domestic production, while for fish they were approximately one third of the total catch. In any case, such high losses during the distribution process for vegetables and fish must suggest that improvements to the distribution mechanism are an urgent matter for the development of agriculture in Sri Lanka.

Now let us observe the financial market for farmer, another indicator of the state of the market economy which farmers are faced with, in addition to the distribution mechanism for agricultural products. When considering such circumstances as the abolishment of expenditures for fertilizer subsidies, it seems clear that how the small scale farmers can get credits is an extremely important issue for the improvement and diversification of management.

A system by which farmers can receive credits from commercial banks at low interest rates thanks to the guarantee of the Central Bank does exist, but in fact only about 2% of all farmers can use this system (FAO/ADB Credit Review of Sri Lanka, 1988). Most farmers procure funds from merchants such as the transport agents discussed earlier, and in many cases must pay monthly interest rates of 10 to 20%. Thus, in Sri Lanka farmers can basically use only informal financial markets.

It was under these circumstances that the Regional Rural Development Bank was established in

1985 and special financial schemes were offered to agriculture and farmers, but the extent to which this has been effective is still not clear. In addition, in 1988 the Praja Naya Niyayamaka scheme was established, in which a village leader is designated, this leader is offered financing at an annual interest rate of 18%, and then relends the money to other small farmers in the village at a monthly interest rate of approximately 3%. It appears, however, that this scheme is not working at all. Thus, there exists a move to institutionalize the special methods of financing for farmers, but there is no doubt that the basic situation in which farmers can only use informal finance markets is still the rule today.

Table 1 Gross Domestic Product of Sri Lanka (current prices series 1,000,000 rupees)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross domestic product	62,246	79,337	94,679	113,878	140,039	149,415	163,713	177,731	203,516	228,138	290,495
Agriculture sector share (%)	27.6	27.7	26.4	28.3	28.7	27.7	27.1	27.0	26.3	25.6	26.3
Agriculture	—	—	21.9	23.8	25.0	24.0	23.1	23.0	22.3	21.4	22.4
Forestry	—	—	1.8	1.7	1.6	1.7	1.9	2.0	2.0	2.0	1.9
Fisheries	—	—	2.7	2.8	2.1	2.0	2.1	2.0	2.0	2.2	2.0
Mining	2.0	2.0	2.4	2.4	2.2	2.2	2.5	2.8	2.7	2.6	2.4
Manufacturing	17.7	16.2	14.4	14.0	14.9	14.7	15.2	16.0	15.3	15.3	14.8
Construction	8.9	8.8	8.4	8.6	7.9	7.8	7.5	7.3	7.3	7.6	7.4
Services	43.8	45.3	48.4	46.6	46.2	47.5	47.6	47.0	42.5	48.8	48.9

Source: Central Bank Annual Reports up to 1990.

Table 2 Production and Export of Plantation Crops in Sri Lanka

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Tea	Planted area (000 ha)	245	245	242	242	228	231	223	221	222	222	222
	Production (000 mt)	191	210	188	179	208	214	211	213	227	207	233
	Exports (000 mt)	187	183	181	158	204	198	208	201	220	204	216
	Earnings (M/US%)	373	334	305	353	620	442	330	362	387	379	495
Rubber	Planted area (000 ha)	223	230	206	206	206	205	203	202	200	200	200
	Production (000 mt)	133	124	125	140	142	138	138	122	122	111	112
	Exports (000 mt)	121	132	131	125	126	120	110	106	99	86	87
	Earnings (M/US%)	157	150	112	121	130	94	94	99	116	86	77
Coconut	Planted area (000 ha)	451	451	416	416	416	416	416	416	416	416	416
	Production (000 mt)	2,026	2,259	2,521	2,398	1,983	2,958	3,039	2,292	1,936	2,483	2,532
	Earnings (M/US%)	69	67	72	75	78	114	85	73	48	79	90
Sugar	Production (mt)	26,500	25,000	24,000	22,000	20,00023	20,000	35,000	35,000	54,000	54,000	57,000
	Imports (100 mt)	208	238	123	268	6	267	324	339	319	380	305

Source: Department of Census & Statistics & Ministry of Plantation Industries

Table 3 Trends in Paddy Planted Area by Irrigation Type in Sri Lanka

Total		Dry zones						Wet zones
		Large-scale irrigation (80ha over)			Small-scale irrigation	Rainfed	Total	
		Mahya season	Yala season	Total				
1952	458.2 (100)	47.9 (11)	46.8 (10)	94.6 (21)	54.3 (12)	71.1 (16)	220.0 (48)	238.3 (52)
1960	584.5 (100)	86.3 (15)	66.8 (11)	153.1 (26)	84.6 (15)	102.7 (18)	340.1 (58)	244.1 (42)
1970	727.8 (100)	132.7 (18)	82.7 (11)	215.4 (30)	103.0 (14)	125.7 (17)	444.1 (61)	283.6 (39)
1980	857.7 (100)	188.7 (22)	107.5 (13)	295.7 (35)	114.3 (13)	154.1 (18)	564.1 (66)	293.7 (34)
1985	874.4 (100)	207.0 (24)	136.7 (16)	343.8 (39)	102.6 (12)	123.0 (14)	569.5 (65)	304.9 (35)
Growth rate								
1952—60	3.1	7.6	4.5	6.2	5.7	4.7	5.6	0.3
1960—70	2.2	4.4	2.2	3.5	2.7	2.0	2.7	1.5
1970—80	1.6	3.6	2.7	3.2	1.0	2.1	2.4	0.4
1980—85	0.4	1.0	5.0	3.1	−2.1	−4.4	0.2	0.8
1952—85	2.0	4.5	3.3	4.0	1.9	1.7	2.9	0.7

Note: Five-year averages for indicated years. Figures in parentheses are the percentages of the total.

Source: Survey by Dr. Masao Kikuchi

Table 4 Development of rice seeds and fertilizer technology in Sri Lanka

	Amount of fertilizer used for rice crop		Percentage of seed types			Rate of irrigation for total planted area
	Total of three major components (N+P+K) (kg/ha)	Nitrogen (N) (kg/ha)	Existing seeds	Old improved variety	New improved variety (%)	
1952	2.6	1.7	100	—	—	48
1960	13.8	8.3	87	13	—	57
1970	53.2	32.9	32	50	9	60
1980	85.2	57.2	13	15	72	62
1985	111.8	75.5	2	6	92	66

Source: Survey of Dr. Masao Kikuchi

Table 5 Trends in Paddy Production in Sri Lanka

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Net area harvested	728	740	661	698	787	768	740	597	725	690	771
Maha	496	501	424	495	451	498	469	380	443	440	462
Yala	232	239	237	194	336	280	271	217	282	250	309
Production (000 mts)	2,133	2,230	2,156	2,484	2,420	2,661	2,588	2,128	2,477	2,63	2,538
Maha	1,453	1,523	1,363	1,786	1,360	1,751	1,688	1,393	1,525	1,342	1,647
Yala	680	707	793	698	1,060	910	900	735	952	721	891
Average yield	2,927	3,014	3,260	3,606	3,076	3,464	3,500	3,564	3,413	3,374	3,415

Source: Department of Census and Statistics.

Table 6 Self-sufficiency for Cereals in Sri Lanka

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Imports											
a) Rice (000 mt)	128	156	161	124	26	182	220	102	189	292	132
b) Wheat flour* (000 mt)	470	380	373	423	434	534	514	438	489	584	572
c) Paddy	2,133	2,230	2,155	2,483	2,413	2,628	2,588	2,128	2477	2,063	2,538
d) Paddy available for consumption (minus 10% wastage seeds, etc.)	1,920	2,007	1,940	2,235	2,172	2,366	2,329	1,915	2,230	1,857	2,284
e) Rice available for consumption from (d) *	1,306	1,365	1,319	1,520	1,477	1,609	1,584	1,302	1,516	1,263	1,553
f) Total cereals for consumption (a) + (b) + (e)	1,904	1,901	1,853	2,067	1,937	2,325	2,318	1,842	2,194	2,139	2,257
g) Local production (e) as % of total consumption(f)	69	72	71	73	76	69	68	71	69	59	69

Source: Department of Census & Statistics; Food Commissioner's Department, and Cooperative Wholesale Establishment.

* Conversion rate : 1 mt wheat = 0.74 mt flour. 1 mt paddy = 0.68 mt rice.

Table 7 Trends in Production of Produce Other than Rice in Sri Lanka

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Production (000 mt)											
Cassava	499	526	573	722	682	598	486	427	492	421	341
Green chilies	51	37	36	41	74	99	106	73	83	68	89
Red onions	67	59	67	96	37	42	57	56	59	72	17
Green gram	9	10	11	17	16	19	19	17	19	20	27
Potato	51	66	77	90	68	89	82	81	87	84	80
Maize	23	24	24	31	38	44	41	42	39	31	32

Source: Department of Census and Statistics.

Table 8 Production and Imports of Livestock and Dairy Products in Sri Lanka

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Production (000 mt)											
Meat	17	17	17	18	19	25	37	38	36	37	
Milk	238	259	254	266	274	283	149	232	191	201	
Eggs	31	32	30	32	32	35	38	46	44	47	
Milk powder	4	4	4	4	3	4	4	4	3	2	
Condensed milk	4	6	4	4	2	4	4	4	3	4	
Imports (000 mt)											
Milk power	21	10	11	26	18	22	26	36	40	47	
Cheese/butter	1	1	1	2	2	—	2	2	1	2	

Source: Department of Census and Statistics

Table 9 Per Capita Intake of Calories, Proteins and Fats in Sri Lanka

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Total calories/day	2,169.40	2,200.12	2,188.69	2,361.43	2,385.95	2,517.48	2,376.83	2,267.40	2,326.10	2,248.37
Vegetable	2,061.94	2,097.29	2,084.64	2,239.15	2,267.19	2,396.64	2,266.74	2,133.87	2,199.80	2,118.11
Animal	107.46	102.83	104.05	122.28	117.86	120.84	110.09	133.53	126.30	130.26
Total proteins/day (gr)	46.63	46.54	47.91	53.07	55.31	55.02	52.10	51.45	52.60	52.19
Vegetable	36.21	36.60	37.50	41.24	43.05	43.26	40.82	38.34	40.16	40.02
Animal	10.42	9.94	10.44	11.83	12.26	11.76	11.28	13.11	12.44	12.17
Total fats/day (gr)	53.68	51.39	51.86	51.44	46.85	57.95	52.05	49.22	48.55	51.38
Vegetable	48.21	46.05	46.60	45.41	40.97	51.70	46.54	42.38	42.83	44.58
Animal	5.47	5.34	5.26	6.03	5.88	6.25	5.51	6.84	5.72	6.80

Source: Department of Census & Statistics

Table 10 Vegetable Prices in Sri Lanka, 1990, rupees/kg

	Tomatoes	Beans	Carrots	Beets	Cabbage
Farm price	6.09	9.69	5.93	5.91	3.39
Wholesale price (Colombo Market)	7.50	11.50	7.33	7.30	4.50
Retail price	16.50	17.20	14.60	14.83	10.08

Chapter Three

Rural and Agricultural Development in Surveyed Areas

Introduction

The field study at the rural village level was conducted mainly in the southern highlands of Sri Lanka. One of the focuses of this field study was the production and distribution of vegetables, and as such we decided to visit vegetable production sites to see the situation.

The surveyed areas included two sites in the Nuwara Eliya district and one site in the Badulla district.

1 Agriculture in the Nuwara Eliya District

(1) Hangraketa county

The Perawaguwa precinct is a village which was also visited during the preliminary survey in August, 1991. It is located in the Hangraketa county in Nuwara Eliya district.

First let us give a general overview of the area in which the Perawaguwa precinct is located.

The Nuwara Eliya district consists of seven counties, including Hangraketa, Karalliyadda,

Rikllagskada, Bullugahapitiya, Pallebowalla, Mandaramuwara and Mutrata. It covers an area of 1,741 km^2 and has an estimated population of 530,900 persons.

The Hangraketa county is located at the very north of the district, adjacent to Kandy district. It has a population of approximately 120,000, and agriculture is the main industry. The arable land includes some 800 hectares on which rice is grown, 175 hectares of forests, 500 hectares of fallow land, and so on. During the Maha season, rice is grown on all 800 hectares of rice land, while during the Yala season 395 hectares are used for rice, the remaining 405 hectares mainly for vegetables.

There are 1909 farmland-owning households, the most numerous in the county, while there are 800 households of landless farmers. The landless farmers split 50% of the production with the landowners.

Agricultural facilities in the county include two large irrigation facilities in the Kitulpe and Maela precincts, while there are 124 other small irrigation facilities. There are also 10 small reservoirs and 61 water gates (small water gates consisting of dammed levees for drawing in water).

As for the agricultural products, due in part to the influence of the period of English reign, the vegetables produced in the Yala season are classified in two groups. The first consists of what are called "English vegetables", including carrots, cabbage, haricots, and tomatoes, the second of "local vegetables", including okra, snake gourd, pumpkins, cucumbers, eggplants, etc.

(2) Perawaguwa

The village of Perawaguwa is located in a highland 18km from Kandy, at an elevation of 700 meters. Kandy is an hour away by bus, and some buses enter the village. There is one elementary school in the village, but the middle school is located out of town. There is also one Buddhist temple.

Geographically, there is a small river running through the center town, which the villagers call "irrigation". On either side of the river are terraced fields in which rice is grown in the Maha season, vegetables in the Yala season.

It was ten years ago that the town first got electricity, and some 60% of the homes in the village have TVs.

Machines are not used for farming, with only a few tractors being used for transportation.

The harvested agricultural products are purchased by dealers who come directly to the village. Once purchased, they are transported to Kandy or Colombo by truck, and fish and other products are transported in to Nuwara Eliya in return.

Now let us introduce Mr. A, who we interviewed in the village.

Mr. A is a farmer belonging to the middle class or higher in the village. He produces rice in the Maha season, vegetables in the Yala season. The main vegetables he produces are tomatoes, cabbage, beans, and okra. He also raises chickens, though on a small scale.

There is a farmer's organization in the village, which is for discussions on the use of the water from the river so called "irrigation", but there are no financial or distribution organizations. The government abolished the system of fertilizer subsidies for farmers in 1990, so the price of fertilizer has more than doubled, greatly affecting the agricultural industry. With this, Mr. A as now started using compost in addition to the chemical fertilizers he previously used, and is attempting to increase his production. The compost consists of cow manure mixed in straw and takes three months to make.

Mr. A does have an income from selling the vegetables he produces, but this income is not enough to allow him to save. In addition, he ships out the vegetables he produces in bags, and is not concerned about damage during transportation.

Mr. A weighs his vegetables at the shipping outlet in the village, but some of the farmers sell directly to dealers on trails on which the dealers pass.

In addition, there are small stores selling vegetables in and around the village. These vegetables are bought directly from the farmers.

(3) 6-mile Post

6-mile Post is a farming village located at an altitude of 2,000 meters, 9.6 km (6 miles) east of the town of Kandapola, which is 10km east of Nuwara Eliya city in the Nuwara Eliya district. It

produces vegetables and tea, and there are two elementary schools and one health center in the village. Electricity was brought into the village 30 years ago, and now virtually all homes have TVs and radios.

For agricultural production, there are tea fields on the upper parts of the hills, while vegetables are produced on the lower parts. Such vegetables as cabbage, carrots, beets, spring onions, egg-plants, potatoes, and turnips are grown in three different seasons during the year. Carrots are produced once per year, while spring onions are produced over five months. Of the vegetables shipped from this village, the ones which get the highest prices are potatoes and spring onions.

Now let us introduce Mr. B, who agreed to be interviewed. Mr. B is a junior college graduate, and lives with his parents and two brothers. All four of his sisters are married and live in other regions.

The land which Mr. B owns covers two hectares, all allotted to the production of vegetables, such as potatoes, spring onions, eggplants and cabbage. For the farm work he employs 12 tea plantation workers, who work for eight hours a day and are paid daily wages of 90 rupees (1 rupee = 3.5 yen as of September, 1991). Meals are not included.

The fields are watered with the water from the river which runs through the village, pumped up using a generator.

Mr. B produces 7,500kg of vegetables per hectare, and has a yearly income of 360,000 rupees. He is careful about shipping the vegetables early in the morning and takes care that they look good, but he does not worry about the their packages (all the vegetables are bagged). He purchases chemical fertilizers in the center of 6-mile Post, and sprays insecticides at the advice of an agricultural supervisor.

Now we will tell about an interview with a dealer in 6-mile Post. There is a small village several minutes away by car from Mr. B's house. A dealershop which collects vegetables and sells seeds stands out amid a small bank and restaurant.

We interviewed Mr. C, the dealer.

Mr. C's company owns three trucks, which are mainly used to transport the vegetables produced in 6-mile Post to Colombo and bring fish and other goods in return.

As for the salaries of his employees, regular employees such as loaders are paid a daily wage of 100 rupees for men, 60 rupees for women. Meals are not included. The truck drivers are paid monthly, and have a monthly income of 2,500 rupees or higher. The trucks are purchased used for 400,000 rupees a piece, and with financing are paid off in three years at 13,000 rupees a month. 300 rupees are spent daily on gasoline, and 4,000 to 5,000 rupees are spent on upkeep each month.

As for the collection of vegetables, the manager, Mr. C himself, visits the farms one by one and sets the prices. Mr. C estimates damages to the vegetables from 6-mile Post to Colombo due to the fact they are packaged in bags. Previously, Mr. C tried shipping the vegetables in crates, but has now returned to bagging because recovery was difficult and because of higher costs.

2 Agriculture in the Badulla District

(1) Badulla District

The Badulla district is adjacent to the Nuwara Eliya district, covers and area of 2,861km^2, and had a population of 736,000 in 1989.

The total number of households is 146,100, and the average family consists of five members. Of these households, 12% do not own land, 9.2% do not have pumps or other facilities for drinking water, 39.3% have no toilets, and 76.7% have no electricity. Because of this, the Badulla district can be considered one of the districts which is most underdeveloped in infrastructure in Sri Lanka.

As for land usage, 65% is farm land, 24% forests, 8.6% protected land, while the remaining 2.4% is residential.

Of the farm land, there are 30,500 hectares of tea fields, 19,220 hectares of rice paddies, 960 hectares of rubber plantations, 1.86 hectares of cocoa, and 175.3 hectares of slash-and-burn land (chena), of which large-scale irrigated land covers 8,493 hectares, while small-scale irrigated land covers 1,893.6 hectares.

As for education, there are 172,670 students, in a total of 578 public, private and Buddhist schools, with a total of 7,072 teachers. However, the Badulla district office has made a request to

the central government for more teachers, especially for college graduates. As for medical care, there are 61 hospitals and clinics in the district, but the district office has made a request to the central government for more nurses.

The proposed plan which the Badulla district office has presented to the central government concerning agricultural development includes the following ten requests:

a) Sufficient provision of potato seeds to farmers.

b) Rehabilitation of small-scale irrigation.

c) Faster repairs of agricultural tools at agricultural service centers.

d) Establishment of fertilizer warehouses in all villages.

e) Provision of housing and official vehicles to agricultural supervisors.

f) Reinforcement of fertilizer and seed supply facilities.

g) Establishment of sales centers for produce.

h) Modernization of agricultural improvement diffusion services.

i) Establishment of a long-term storage system for vegetables and fruits.

j) Reinforcement of seed paddy provision system.

In addition, the district office has also made requests to the central government concerning the reinforcement of stockbreeding and land protection.

(2) Kumbawala

The village of Kumbawala is located on a highland at an altitude of 700m, 10km northwest of the city of Badulla in the Badulla district. The population of the village is approximately 1,000, consisting of 150 households, of which some 95% are employed in agriculture. The remaining 5% are public workers, etc. There is no school in the village -- the school is located in a village 3km away.

Kumbawala is surrounded by mountains on both sides, and a road linking Badulla city with the town of Welimada runs through the center of the village. A small river flows along this road, and the villagers use it for bathing.

The water from a stream flowing from a peak to the west of the village is used for agriculture, and the necessary amount is drawn into the fields from up-stream.

The cultivated land surface per household is smaller in Kumbawala than in the two villages visited in the Nuwara Eliya district, and Kumbawala is poor. Because of this, the government offered assistance in the form of a pump for drinking water as a part of its policy against poverty, but there is still no electricity in the village, and batteries are the villager's only source of electricity.

Now we will introduce Mr. D and his family, whom we interviewed. Mr. D was born in Kumbawala, but his wife is from Badulla city. Mr. D lives with his eldest son, his son's wife, and his two-year-old grandson. Mr. D was the second son. When he was young he purchased 0.5 hectares of land from his elder brother, who lives in the same village, and worked the land, but now leaves the work to his eldest son.

Mr. D and his family produces rice and vegetables in the Maha season, vegetables only in the Yala season. The vegetables produced in the Yala season include eggplants, tomatoes, beans and cabbage. Previously they also produced potatoes, but they stopped because of the high price of potato seeds.

They ship out vegetables each week, but do not sell them at specific shipping outlets or to specific dealers, but directly to various different dealers.

They are currently trying to improve their vegetable production by increasing the production of tomatoes, which are more profitable.

Mr. D's eldest son and his wife say they only want one child, because of the high costs of rearing children, in particular the high cost of education.

3 Summary

We have now discussed the general situation of the Nuwara Eliya and Badulla districts, their agricultural situation, the situation in the surveyed villages, the agricultural production and the life

of the villagers. Now we will compare agricultural production in the two districts.

First, both districts are vegetable and fruit production sites, and do not produce mainly rice, as do the districts of Kurunegala, Polonnaruwa, Ampara, and Hambantota.

The crop which distinguishes both districts is potatoes. The total national production of potatoes in 1990 was 50,974 tons in the Maha season, 35,882 tons in the Yala season. 24,787 tons were produced in the Nuwara Eliya district in the Maha season, 5,505 tons in the Yala season, and in the Badulla district 20,879 tons were produced in the Maha season, 35,882 tons in the Yala season. Thus, these two districts together accounted for 90% of the national production of potatoes in the Maha season, and as much as 99% in the Yala season. In all of Sri Lanka, natural conditions are most appropriate for the production of potatoes in these two districts. (Tables 10-1 and 10-2)

For the production of maize, the Badulla district is fourth nationally in the Maha season, second in the Yala season. (Tables 6-1 and 6-2)

For the production of millet, the Nuwara Eliya district is third nationally in the Maha season, fourth in the Yala season. (Table 7)

The production of cowpea, sesame, peanuts (ground nuts), soya beans, cassava, big onions, red onions, blackgram and chili is shown on the following tables, but these are not very abundant in either Nuwara Eliya or Badulla.

Finally, let us add our observation that much potatoes, tomatoes, cabbage, eggplant and carrots were produced in the Nuwara Eliya district, while much turnips and eggplant were produced in the Badulla district.

Table 1-1 Production of cowpea (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	30	18	0.6	36	22	0.61	38	32	0.84	22	8	0.36	74	22	0.30
Badulla	593	529	0.89	303	1,125	3.71	742	417	0.56	202	124	0.61	174	146	0.8
National total	18,104	12,550	0.69	14,063	12,075	0.86	16,289	12,495	0.77	13,069	9,313	0.71	20,857	15,261	0.73

Source: Department of Agriculture, Peradenia

Table 1-2 Production of cowpea (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	15	7	0.47	19	11	0.58	15	9	0.60	44	13	0.30	—	—	—
Badulla	387	303	0.78	139	112	0.81	194	152	0.78	112	89	0.79	146	130	0.89
National total	4,589	4,262	0.93	7,781	5,356	0.69	7,591	5,577	0.73	6,814	5,620	0.82	6,989	5,396	0.77

Source: Department of Agriculture, Peradenia

Table 2-1 Production of sesame (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	5	2	0.40	—	—	—	—	—	—	—	—	—	—	—	—
Badulla	85	34	0.40	253	114	0.45	247	112	0.45	—	—	—	42	20	0.48
National total	4,123	3,108	0.75	2,919	2,225	0.76	2,615	1,454	0.56	1,712	1,112	0.65	2,414	1,425	0.59

Source: Department of Agriculture, Peradenia

Table 2-2 Production of sesame (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Badulla	5	2	0.40	6	3	0.50	86	42	0.49	—	—	—	62	25	0.40
National total	7,409	3,230	0.44	14,444	8,103	0.56	14,932	7,540	0.50	13,906	2,353	0.17	15,361	6,614	0.43

Source: Department of Agriculture, Peradenia

Table 3-1 Production of peanuts (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Badulla	131	154	1.18	83	99	1.19	73	74	1.01	59	52	0.88	93	103	1.11
National total	6,709	6,778	1.01	6,264	13,726	2.19	8,412	7,701	0.92	7,942	6,850	0.86	7,590	7,590	1.00

Source: Department of Agriculture, Peradenia

Table 3-2 Production of peanuts (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Badulla	75	87	1.16	43	49	1.14	51	55	1.08	52	49	0.94	82	75	0.91
National total	3,541	3,049	0.86	3,199	4,021	1.26	4,123	4,208	1.02	2,403	1,982	0.82	3,401	3,528	1.04

Source: Department of Agriculture, Peradenia

Table 4 Production of soya beans (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	33	16	0.48	20	10	0.50	48	38	0.79	4	3	0.75	—	—	—
Badulla	9	9	1.00	12	8	0.67	—	—	—	2	2	1.00	39	44	1.16
National total	4,841	5,243	1.08	5,715	8,519	1.49	7,535	8,962	1.19	3,923	1,851	0.47	1,170	1,495	1.28

Source: Department of Agriculture, Peradenia

Table 5-1 Production of cassava (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production per hectare (t)	Production (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	315	3,750	11.90	2,219	2,219	1.00	283	2,586	9.14	137	682	4.98	757	3,780	4.99
Badulla	717	16,692	23.28	957	19,152	20.01	789	12,821	16.25	854	15,455	18.60	525	9,852	18.77
National total	19,732	210,472	10.67	21,686	274,220	12.65	22,341	380,075	17.01	18,466	203,237	11.01	14,472	176,395	12.19

Source: Department of Agriculture, Peradenia

Table 5-2 Production of cassava (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	80	732	9.15	79	948	12.00	36	288	8.00	132	1,320	10.00	—	—	—
Badulla	139	3,216	23.14	158	3,456	21.87	111	1,665	15.00	26	488	18.77	20	396	19.80
National total	7,899	106,323	13.46	6,108	74,844	12.25	9,506	109,175	11.48	6,612	72,882	11.02	6,505	74,923	11.52

Source: Department of Agriculture, Peradenia

Table 6-1 Production of maize (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	375	113	0.30	187	20	0.11	239	197	0.82	155	54	0.35	177	89	0.50
Badulla	5,041	5,350	1.06	5,346	5,601	1.05	5,202	5,502	1.06	5,339	4,449	0.83	4,462	4,909	1.10
National total	36,232	40,511	1.12	39,085	45,112	1.15	50,244	70,435	1.40	36,968	36,266	0.98	47,745	54,536	1.14

Source: Department of Agriculture, Peradenia

Table 6-2 Production of maize (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	9	2	0.22	6	6	1.00	—	—	—	42	29	0.69	42	36	0.86
Badulla	68	36	0.53	43	30	0.70	25	15	0.60	30	12	0.40	6	8	1.33
National total	156	108	0.69	114	124	1.09	185	134	0.72	182	159	0.87	196	218	1.11

Source: Department of Agriculture, Peradenia

Table 7 Production of millet (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	16	8	0.50	13	6	0.46	18	9	0.50	34	17	0.50	36	28	0.78
Badulla	30	18	0.60	4	2	0.50	5	3	0.60	1	1	1.00	7	4	0.57
National total															

Source: Department of Agriculture, Peradenia

Table 8-1 Production of big onions (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	1	1	1.00	3	21	7.00	—	—	—	—	—	—	3	15	5.00
Badulla	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
National total	11	31	2.82	18	178	9.89	15	165	11.00	14	116	8.29	15	132	8.80

Source: Department of Agriculture, Peradenia

Table 8-2 Production of big onions (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	27	420	15.56	9	NA	NA	4	40	10.00	4	9	2.25	9	72	8.00
Badulla	1	2	2.00	4	19	4.75	12	108	9.00	37	318	8.59	17	167	9.82
National total	502	5,555	11.02	421	4,037	9.59	607	6,661	10.97	974	10,983	11.28	1,790	19,872	11.10

Source: Department of Agriculture, Peradenia

NOTE: NA = Not Available

Table 9-1 Production of red onions (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	—	—	—	157	1,104	7.03	206	1,724	8.37	70	210	3.00	—	—	—
Badulla	52	450	8.65	71	453	6.38	79	486	6.15	15	109	7.27	10	69	6.90
National total	4,348	26,835	6.17	6,338	67,490	10.65	6,111	64,121	10.49	4,996	48,231	9.65	6,558	72,800	11.10

Source: Department of Agriculture, Peradenia

Table 9-2 Production of red onions (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	201	804	4.00	104	74	0.71	281	843	3.00	114	458	4.02	43	129	3.00
Badulla	53	318	6.00	105	698	6.65	48	341	7.10	40	292	7.30	52	437	8.40
National total	4,289	49,676	11.58	4,629	45,052	9.73	4,924	49,425	10.05	5,227	59,458	11.38	2,383	24,213	10.16

Source: Department of Agriculture, Peradenia

Table 10-1 Production of potatoes (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	1,685	26,960	16.00	1,568	25,093	16.00	11.94	18,260	15.29	1,194	16,641	13.94	1,983	24,787	12.50
Badulla	2,714	30,167	11.12	2,183	23,009	10.54	23.60	25,571	10.84	2,040	20,563	10.08	2,331	20,878	8.96
National total	4,593	58,737	12.79	3,822	49,078	12.84	36.11	44,482	12.32	3,410	39,730	11.65	4,846	50,947	10.51

Source: Department of Agriculture, Peradenia

Table 10-2 Production of potatoes (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	865	13,167	15.22	695	16,786	24.15	705	10,642	15.10	1,174	17,721	15.09	337	5,505	16.34
Badulla	2,407	36,269	15.07	2,532	25,280	9.98	2,270	23,100	10.18	2,241	36,360	16.22	2,555	30,302	11.86
National total	3,274	49,462	15.11	3,228	42,076	13.03	2,975	33,753	11.35	3,415	54,081	15.84	2,899	35,882	12.38

Source: Department of Agriculture, Peradenia

Table 11-1 Production of blackgram (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	34	26	0.76	16	8	0.50	0	0	0	4	2	0.50	3	2	0.67
Badulla	11	10	0.91	24	22	0.92	13	10	0.77	7	5	0.71	17	13	0.76
National total	9,406	6,840	0.73	11,709	9,372	0.80	16,860	12,328	0.73	9,948	5,810	0.58	17,575	12,361	0.70

Source: Department of Agriculture, Peradenia

Table 11-2 Production of blackgram (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	—	—	—	—	—	—	2	1	0.50	—	—	—	—	—	—
Badulla	2	1	0.50	6	4	0.67	—	—	—	—	—	—	7	6	0.86
National total	713	925	1.30	2,343	3,239	1.38	1,358	828	0.61	924	720	0.78	224	272	1.21

出所 Department of Agricure, Peradenia

Table 12-1 Production of chili (Maha season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated lanc (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production land (t)	Production per hectare (t)
Nuwara Eliya	262	39	0.15	235	35	0.15	—	—	—	—	—	—	—	—	—
Badulla	585	427	0.73	558	340	0.61	564	298	0.53	469	385	0.82	357	277	0.78
National total	13,865	14,060	1.01	13,450	11,316	0.84	12,986	11,089	0.85	13,949	14,237	1.02	18,615	16,885	0.91

Source: Department of Agriculture, Peradenia

Table 12-2 Production of chili (Yala season)

	1986			1987			1988			1989			1990		
	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)	Cultivated lanc (ha)	Production (t)	Production per hectare (t)	Cultivated land (ha)	Production (t)	Production per hectare (t)
Nuwara Eliya	167	32	0.19	168	24	0.14	—	—	—	30	45	1.50	—	—	—
Badulla	561	180	0.32	321	208	0.90	242	236	0.98	213	285	1.34	175	228	1.30
National total	23,497	31,520	1.34	12,959	15,892	1.23	18,275	25,224	1.38	13,003	15,807	1.22	22,239	24,507	1.10

Source: Department of Agriculture, Peradenia

Figure 1 6-mile Post

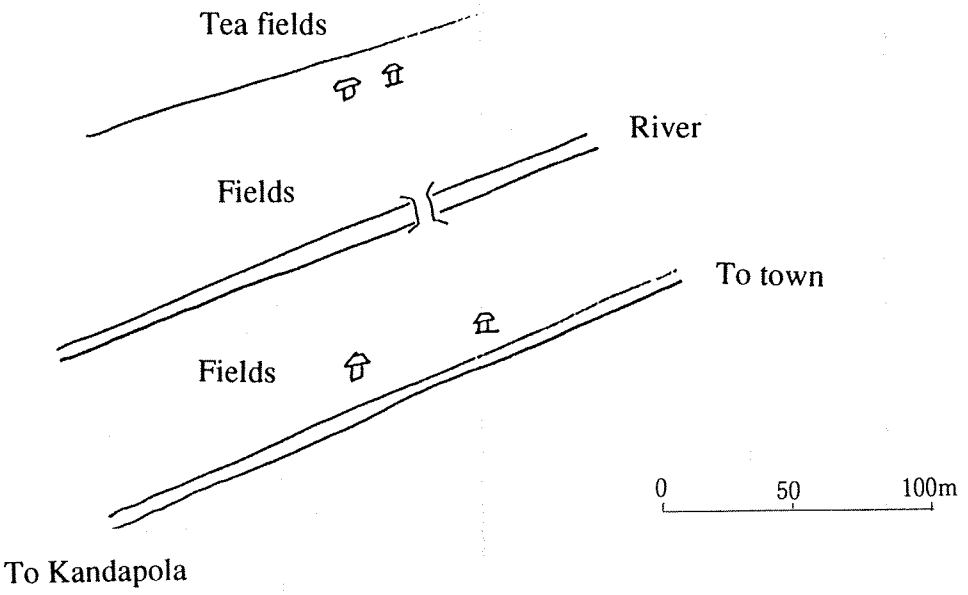


Figure 2 Perawaguwa

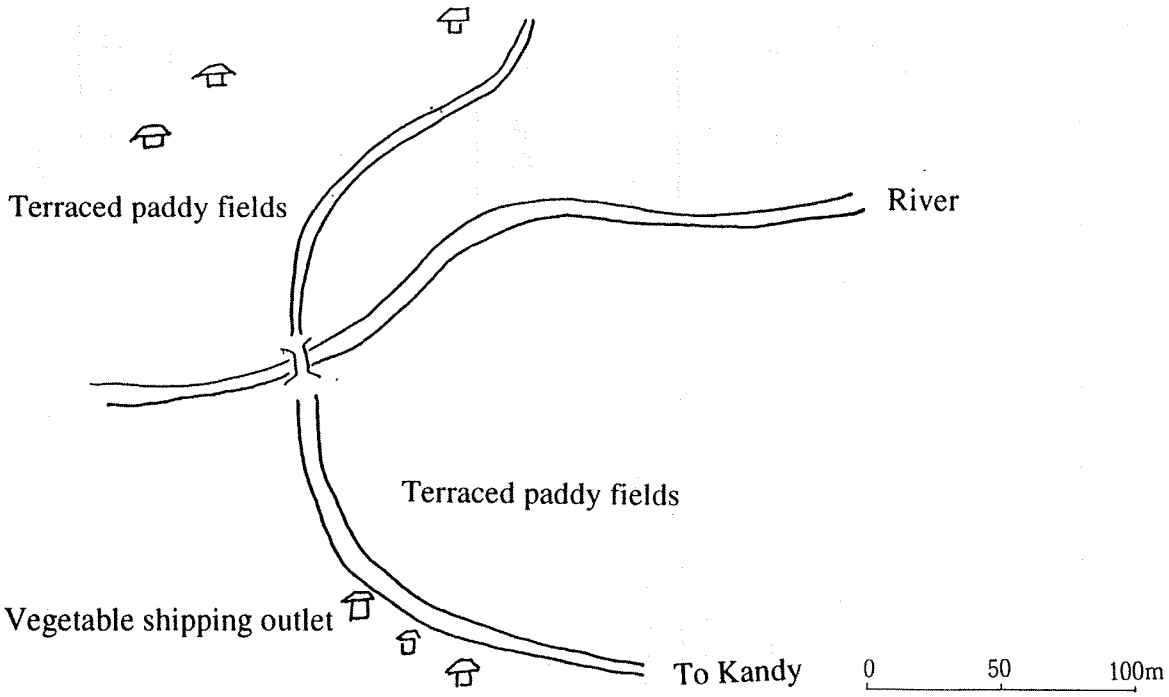
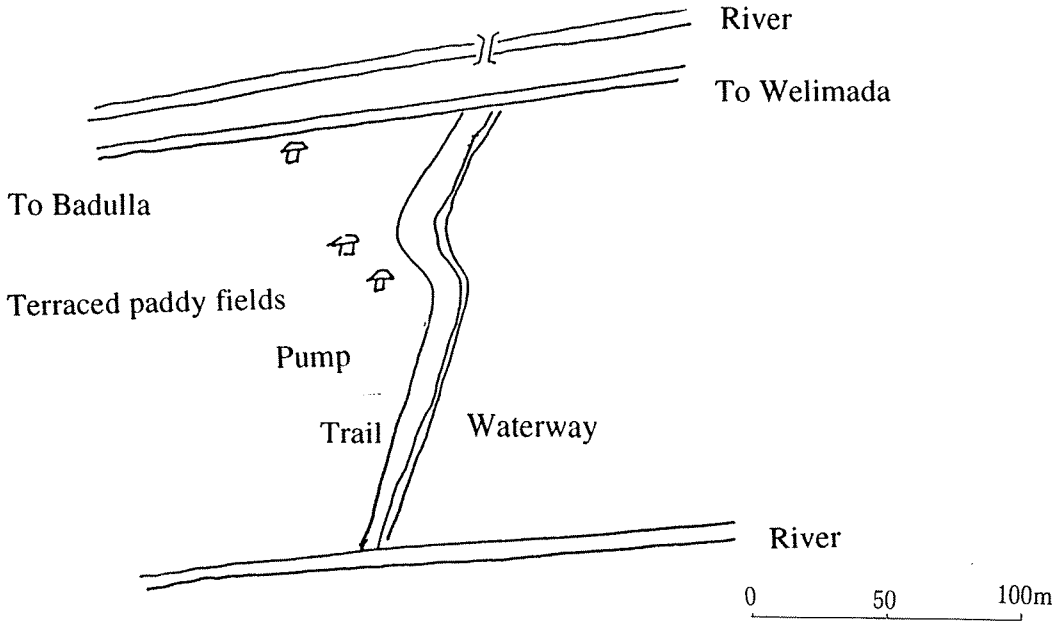


Figure 3 Kumbawala



Chapter Four

Survey Members and Itinerary

1 Survey Members

(1) Japanese Committee

Shigeto Kawano	Professor Emeritus, The University of Tokyo
Yonosuke Hara	Professor, Institute of Oriental Culture, The University of Tokyo
Hirokazu Ogihara	Full-Time Lecturer, Dept. Food Technology, College of Agriculture and Veterinary Medicine, Nihon University
Tomomi Otsuka	Assistant Professor, College of Humanities and Sciences, Nihon University
Tsuguo Hirose	Director, Secretary General, Asian Population and Development Association (APDA)
Masaaki Endo	Assistant Secretary General, Asian Population and Development Association (APDA)
Yoshio Nagai	Researchist, Asian Population and Development Association (APDA)
Osamu Kusumoto	Researchist, Asian Population and Development Association (APDA)

(2) Preliminary Research (August 11, 1991 - August 17, 1991)

Masaaki Endo	(ditto)

(3) Field Research Team (September 15, 1991 - September 28, 1991)

Yonosuke Hara	Research Chief (ditto)
Masaaki Endo	(ditto)
Osamu Kusumoto	(ditto)

2 Cooperators in Sri Lanka

(1) Embassy of Japan

Isamu Nitta	Ambassador
Ituo Hashimoto	Minister
Shin Murakami	First Secretary
Ei Kubota	Second Secretary

(2) Government and Institutes

Lalith Athulathmudali	Member of Parliament, Chairman, Sri Lankan Parliamentarians for Population and Development
Neville Fernando	Member of Parliament, Senior Vice Chairman, Sri Lankan Parliamentarians for Population and Development
Dharmadasa Banda	Minister of Agricultural Development and Research
Wirmal Wickramasinghe	Minister of Policy Planning and Implementation
Nimal Ranaweera	Deputy Director of Agriculture, Department of Agriculture, Sri Lanka
E. Suraweera	Agricultural Economist, Economic & Planning Division, Department of Agriculture
G. Balasuriya	Agricultural Economist, Economic & Planning Division, Department of Agriculture
Dixon Nilaweera	Secretary, Ministry of Agricultural Development and Research
D.G.P. Seneviratne	Director, Agrarian Research and Training Institute
K.B. Wijekoon	Director, Agrarian Development
A.T.P.L. Abeykoon	Director, Population Division, Ministry of Health and Women's Affairs
Malathi Weerasooriya	Program Officer, UNFPA

K. Yoganathan	Director, Irrigation Department
Roberto Bentjerodt	Senior Operations Officer, The World Bank
A.B. Talagune	Chief Secretary, UVA Province
A.A.D. Cyril Yasasili	Director of Census & Statistics, Department of Census & Statistics
A.G.W. Nanayakkara	Deputy Director of Census & Statistics, Department of Census & Statistics
K.H.S. Gunathilaka	Director General, Mahaweli Authority of Sri Lanka
P.T. Senaratne	Secretary General, Mahaweli Authority of Sri Lanka
Ranjit D. Wanigaratne	Director, Planning and Monitoring Unit, Mahaweli Authority of Sri Lanka
Peer Hijmans	F.A.O. Representative of Sri Lanka
K.B. Shrestha	F.A.O. Representation Office

Preliminary Survey Itinarary

Period: August 11, 1991 - August 17, 1991

Date	Outline of Survey
August 11 (Sun.)	* Leave Narita, stopover in Singapore, arrive at Colombo.
August 12 (Mon.)	* Discussion of survey outline with Dr. N. Fernando, Vice Chairman, Sri Lankan Parliamentarians for Population and Development. * Visit to Embassy of Japan. Pay Courtesy Call to Ambassador Nitta. Discussion of survey outline with First Secretary Shin Murakami. * Pay Courtesy call to Hon L. Athulathmudali, Chairman, Sri Lankan Parliamentarians for Population and Development. * Visit to Ministry of Agricultural Development and Research. Briefing on Sri Lankan agricultural situation by Dr. Dixon Nilaweera, Secretary.
August 13 (Tues.)	* Visit to FAO. Briefing on multinational agricultural cooperation by Mr. K.B. Shrestha. * Visit to Manning Market.
August 14 (Wed.)	* (Move from Colombo to Kandy and Nuwara-Eliya.) * Visit to Department of Agriculture. Briefing on agricultural situation in Kandy and Nuwara-Eliya by Mr. K.B. Wijekoon, Director, Agrarian Development. * Visit to village in Nuwara-Eliya. * (Move from Kandy and Nuwara-Eliya to Colombo.)
August 15 (Thurs.)	* Visit to Minister of Policy Planning and Implementation. Pay Courtesy Call to Minister Wimal Wickramasinghe. Briefing on national development plans. * Visit to Agrarian Research and Training Institute. Briefing on Sri Lankan agrarian research by Mr. D.G.P. Seneviratne, Director.
August 16 (Fri.)	* Visit to Embassy of Japan. Report on survey results to First Secretary Shin Murakami. * Report on survey results to Dr. N. Fernando, Senior Vice Chairman, Sri Lankan Parliamentarians for Population and Development. * Leave Colombo.
August 17 (Sat.)	* Arrive at Narita via Singapore.

Survey Itinerary

Period: September 15, 1991 - September 28, 1991

Date	Outline of Survey
September 15 (Sun.)	* Leave Narita, stopover in Singapore, arrive at Colombo.
September 16 (Mon.)	* Discussion of outline of survey with Dr. N. Fernando, Senior Vice Chairman, Sri Lankan Parliamentarians for Population and Development. * Visit to Embassy of Japan. Pay Courtesy Call to Ambassador Nitta. Discussion of outline of survey with First Secretary Shin Murakami.
September 17 (Tues.)	* Visit to UNFPA. Briefing on births, deaths and age of marriage by Ms. Malathi Weerasooriya. * Collection of materials at Central Bank of Sri Lanka. * Visit to FAO. Briefing on international cooperation of the FAO by Mr. Peer Hijmans, Representative.
September 18 (Wed.)	* Observing Mannig Market. * Visit to Ministry of Health and Women's Affairs. Briefing on Sri Lankan population by Dr. A.T.P.L. Abeykoon, Director of Population Division. * Visit to Department of Census & Statistics. Briefing on statistics in Sri Lanka by Mr. A.A.D. Cyril Yasasili, Director.
September 19 (Thurs.)	* Pay Courtesy Call to Hon. Dharmadasa Banda, Minister of Agricultural Development and Research and briefing on agriculture in Sri Lanka. * Move from Colombo to Kandy.
September 20 (Fri.)	* Visit to Ministry of Agricultural Development and Research. Discussion of agricultural survey with Mr. K.B. Wijekoon, Director of Agrarian Development. * Visit to Department of Agriculture (DOA). Briefing on marketing system for agricultural products by Dr. E. Suraweera, Agricultural Economist, Economic & Planning Division. * Visit to Agriculture Office. Briefing on agriculture in Hanguranketa District from Mr. Nihal K. Atapattin, Agricultural Economist, DOA. * Visit to Perawanguwa village in Hanguranketa District. Observing village and interviews with farmers.

Date	Outline of Survey
September 21 (Sat.)	* Move from Kandy to Nuwara-Eliya. * Observing Nuwara-Eliya municipal market.
September 22 (Sun.)	* Visit to 6 Mile Post District in Kandapola. Interviews with farmers and vegetable collectors. * Move from Nuwara-Eliya to Bandarawela.
September 23 (Mon.)	* Visit to Uva Provincial Council. Briefing on general information and agriculture of Uva Province by Mr. A.B. Talagune, Chief Secretary.
September 24 (Tues.)	* Move from Bandarawela to Colombo.
September 25 (Wed.)	* Visit to Colombo office of World Bank. Briefing on agricultural projects in Sri Lanka by Mr. Roberto Bentjerodt, Senior Operations Officer. * Discussions with members of Sri Lankan Parliamentarians for Population and Development. * Visit to Mahaweli Authority. Briefing on Mahaweli project by Mr. K.H.S. Gunatilaka, Director General.
September 26 (Thurs.)	* Visit to Irrigation Department. Briefing on irrigation in Sri Lanka by Mr. K. Yoganathan, Director. * Report on survey results to Dr. N. Fernando, Senior Vice Chairman, Sri Lankan Parliamentarians for Population and Development. * Report on survey results to Embassy of Japan.
September 27 (Fri.)	* Arrangement of collected materials. * Leave Colombo, stop over in Singapore.
September 28 (Sat.)	* Arrive at Narita.

Chapter Five

Materials

An Assessment of Causes for
Vegetable Price Increase and Solutions

Introduction:

Sharp increases in the price of vegetables has raised concerns in many quarters. These increases have severely limited the purchasing power of the urban consumers. However, the producers too have continued to complain about the low returns from vegetable production.

At the request of the Ministry, Agricultural Development and Research a study was undertaken to assess the causes for the increase in vegetable prices. The study consisted of

a - a survey of production in the major vegetable producing areas in Nuwara Eliya and Matale, and

b - a survey of wholesale and retail markets of Kandy and Colombo.

Results:

1. Degree of Price Increase: The retail price of vegetables has increased sharply during the last 4 - 5 years, more so in the recent past. The prices of other food commodities too have increased sharply during this period closely following the same trend displayed by vegetables. As indicated in table 1. the increase in the price of vegetables is somewhat large compared to the price increases in most other food commodities. While the prices of non-vegetable commodities have increased twofold those of vegetables have increased nearly threefold.

2. Changes in Planting and Production: Data on area planted and production indicate that except in 1989 (during which period all production activities were adversely affected by civil unrest) both the extent planted and total production of vegetables have increased countrywide (Table 2). In up country areas extent planted to vegetables in Nuwara Eliya and Badulla districts have increased (Table 3). Land previously left fallow between two main seasons, not planted to potato due to disease problems etc. have been planted to exotic vegetables. However, in the mid country districts of Matale and Kandy, certain vegetables have been severely affected by disease and pest problems with consequent decreases in extent planted. Overall, the extent planted to vegetable is the major producing districts have not shown significant changes.

   Therefore, supply problems do not appear to be a major cause of price increase.

3. Cost Analysis: An analysis of costs of vegetable production show that costs have increased by 20% between 1989-90 and 15% between 1990-91 (Table 4a). This is primarily on account of increase in the cost of inputs used in vegetable production. The costs of inputs such as seed, fertilizer, agro-chemicals and labour have all increased during the period 1989-91 as indicated in table 4b. From 1989 to 1990, the cost per unit of fertilizer has increased most due to withdrawal of subsidy.

Increase in the cost of labour has accounted for most of the increase in the cultivation cost. Of the capital inputs, fertilizer cost increase accounts for a major share of the cost increase since fertilizer usage is high in many up country vegetables.

4. **Marketing Margins:** After the produce leaves the farm it changes physical possession and ownership several times before reaching the consumer. The main points of transfer at which the price changes can be recorded are the wholesale market and the retail market.

The figures 1-5 indicate the trends in the farm gate, wholesale and retail prices of several vegetables over the period 1985-89. The increase in the retail price of vegetables during this period has been mainly on account of the increases in marketing margins. From that too, the retail margins appear to have increased more than the wholesale margins.

5. **Transport Cost:** The cost of transport has increased over time due to sharp increase in fuel prices, import costs of vehicles, spare parts etc. However, the competitive conditions created by increased road haulage capacity subsequent to transport liberalization has helped to contain the actual increase in transport costs. Therefore, at the point of wholesale the share of the transport cost is still kept low. Yet, the transport agents seem to exert certain amount of control over the ability of the producer to supply to a particular wholesaler as at the points of collection of produce (road sides, village polas, fairs, etc.) some agents dominate collection process by carving out areas of operation for themselves.

6. **Wholesale Operation:** At the point of wholesale marketing, the produce moves through a wholesaler in the major markets such as Kandy or Colombo. The costs after the produce leaves the farm gate incurred upto the point of wholesale come from several areas. i.e.

a - collection and transport to wholesale market - Produce collectors operating at the village level assemble the production from several small farmers to bring up adequate volume before handing over to the transport agents. Also when the farm is located far away from a trunk road farmers have to operate through an agent to hold produce until collection by the agent. In such occasions there are no standard rates or commission like in other steps of marketing. The rates observed ranged from Rs. 0.50-1.00/Kg.

b - handling cost for loading/unloading - Main cost of handling is charged by the labourers moving the produce from the lorry to the wholesale floor and the rates are usually uniform. The current rate is Rs 3.00 and Rs 1.00 per each piece which is usually a sack weighing 50 kg.

c - transport agents commission/margin - Transporting rates are also quite uniform between two locations and presently range from Rs.30 and 35 respectively to Colombo and Kandy from Nuwara Eliya.

d - wholesale margin - This is a fixed rate of 10% of the gross value of the produce sold.

In the current operation of the wholesale vegetable marketing, the wholesale market is merely a transit point at which the produce is sold to retailers or another regional wholesaler without any change in quality or quantity except for weight loss due to drying. The scale of operation is very large with each wholesaler handling several tons of produce everyday.

7. Retail Operation: At the point of retail the produce is sold to consumers by a chain of retailers operating off the main market or at various grocery stores. The produce undergoes a significant amount of transformation since it leaves the farm gate as it is cleared, sorted, and graded before retail. The cost incurred between the point of wholesale and retail are associated with

a - transport and handling - Transport costs can vary widely depending on the distance of transport from the wholesale market to the retail point. For the retailers who operate off the wholesale market there is no cost for transport.

b - marketing losses - Wastage and weight loss are important costs as produce is sorted, cleaned and prepared for retail after it is taken possession by the retailer. In situations where it is transported over long distance again the damage, drying etc. add up further to costs. For the study prices from the retailers operating off the main wholesale markets in Kandy and Colombo were studied.

c - retailers margin - Depending on the nature of retailers business the mark up necessary to maintain a daily income or particular margin of profit from the sales operation will be decided by the trader. The retailers at the wholesale market operate on a daily minimum income basis.

Prices on the same day at the farm gate, wholesale market and the retail market for several vegetables are reported in the table 5a and 5b. As seen clearly the retail price is almost double that of the wholesale price for the same produce. The actual extent of the marketing margins at various points of trade can be seen from the following data which was collected from the Kandy and Colombo markets on weekdays during early September (Table 6a and 6b).

Discussion:

The share of the consumers rupee that goes to the vegetable producer is less than or about 50 percent in the case of all important categories of vegetables. This share has actually decreased over time. Therefore, by adopting measures that can bring down the cost of production alone the retail price of vegetables in the open market may not come down. Improvements will be needed in the whole spectrum of activity associated with the production and marketing of vegetables.

1. Production Improvement - Any action taken to bring down the price of vegetables should also address the issue of keeping the costs as low as possible so that the farmers can maintain adequate levels of profit. One primary means by which the cost of production of vegetables can be decreased significantly is by increasing the productivity. In up

country districts the productivity is quite high already and the farmer yields compare very well with the potentials. Therefore, the space for yield improvement appear to be small. Possibility for cost reduction exist in the up country as excessive use of manure and agro-chemicals are known to be problems with this sector.

In the case of low county vegetables the farmer yields are still lower than the potentials. Pest and diseases and poor management appear to be major reasons for low yields. In this sector yields can be increased by providing pump irrigation, better quality seed, varieties resistant to pests and diseases and short duration that fit in better between main seasons.

2. **Marketing Improvement:** It is evident from the data above that the marketing margin between wholesale and retail operations may be too excessive compared to the services provided. Also compared to the size of the margin of the whole operation opportunity to bring down the prices too are largely available here.

a. **Wholesale Marketing:** The margin at the point of wholesale too may be too large if conditions for greater transparency of the market, for free competition exist. The system operates with a universal wholesalers margin of 10% (except for potato and onions) which has not changed over the years. The prices are determined daily on a market-clearing-price for the day (in practice half-day) basis and superficially appear to be quite close to pure competition. However, charges of collusion between transport agents who have virtually carved out areas of collection for themselves and a few wholesalers in the market cannot be completely ruled out although verification of this is difficult. The main transit points in Kandy, Nuwara Eliya and Pettah (Manning market) are congested and few wholesalers who are licensed to operate dominate the whole operation. There is no space for free entry or exit as required to satisfy fair competitive conditions.

b. **Retail Marketing:** Anyhow problems at the retail arrangements are not insignificant either. Retailers either operating off the central market or from the village grocery shops conduct their business on a fixed daily income or competitive ratio of profit basis as with other non-perishable commodities. They are required to mark up the produce significantly above the wholesale price to cover up the costs below.

a - Wastage and weight loss - These costs are higher as produce is cleared, sorted and graded for retail. In the case of retailers outside the main market and village shops, weight loss too is significant.

The amount of waste is highly variable from crop to crop although often disputed by market participants. But the accumulated loss at various points could still be large in terms of cost.

b - Cost of capital - As the cost of capital especially for the traders operate off the main market who borrow money daily from informal sources is significant since daily operations need to cover up this cost.

c - Scale economies - Compared to the wholesalers who handle large volumes most retailers handle small quantities both due to day-to day nature of the business and perishable nature of the produce. As the overheads to be covered up are not different from those of other market participants higher mark up becomes non-avoidable. The daily volume for a retailer operating off the Kandy wholesale market will range from 50-150 kg with 100 kg being the most frequent.

e - Informal rents - Rents associated with space in the major markets are not quite obvious but often large. Retailer space outside main vegetable wholesale premises in Kandy range from Rs. 50-100/day depending on the location.

The solution to the above problems that occur at the retail marketing lies in taking some of the burdens/costs off the retailer by adopting improvements such as

Recommendations:

Production Improvement

a. Educate up country farmers about rational use of fertilizers and pesticide.

b. Provide varieties having better resistance to pests and diseases and short-aged so that they can be grown in between main crop seasons in the low country areas.

c. Farmer assistance such as reasonably priced water pumps, other implements for undertaking vegetable cultivation in the low country areas.

Marketing Improvement

a - provision of operating capital at concessionary rates especially to retailers through formal credit sources.

b - Improve infrastructure for unloading, storage, cleaning etc. at the wholesale and retail markets by providing space, water services etc.

c - Create more space for free entry and exit by both wholesale and retail traders by expanding physical space in the major markets and also by promoting creation of additional wholesale markets in the regions.

d - Improve space and facilities at the major transit markets for short period storage of produce, with a view to reduce day-to-day price fluctuations.

e. Undertake a long term programme for preventing marketing losses by improved post-harvest handling. i.e. planned programme to make use of better containers economical to the traders as well as producers.

Table 1. Annual Average Retail Prices of Vegetables and Other Food Stuffs

(Rs/kg)

	1985	1986	1987	1988	1989	1990	1991
Rice	8.15	8.32	8.24	8.97	12.6	15.74	15.26
Beef	31.25	33.67	36.51	41.37	49.22	61.9	68.65
Fish	40.3	40.92	39.3	51.71	51.89	68.19	83.71
Eggs	1.55	1.56	1.54	1.8	2.35	2.13	2.26
Dhal	27.06	33.15	32.38	32.12	32.91	55.61	54.72
Vegetables							
Leeks	9.66	12.7	12.4	13.62	15.28	21.42	24.38
Tomato	10.68	13.74	15.3	16.48	21.75	24.35	30.70
Carrot	8.42	12.62	12.7	14.32	17.93	20.58	24.48
Brinjal	8.87	9.28	10.73	10.91	14.48	18.44	19.55
Pumpkin	6.46	7.47	8.15	7.73	9.33	10.79	12.68

Source : Central Bank of Sri Lanka AR & TI Food Commodities Bulletin

Table 2. Total Extent Planted (Ha) & Total Production (MT) of Vegetables 1985–1989

Year	Brinjal		Bandakka		Tomato	
	Ext	Pro	Ext	Pro	Ext	Pro
1985	5,953	84,273	6,760	33,072	2,693	32,413
1986	2,866	42,929	4,338	27,489	2,272	26,717
1987	6,333	66,852	5,680	34,728	3,112	34,223
1988	5,965	67,050	5,777	35,834	3,620	59,726
1989	5,379	63,544	4,802	33,223	2,715	31,916

Year	Beans		Beetroot		Cabbage		Leeks	
	Ext	Pro	Ext	Pro	Ext	Pro	Ext	Pro
1985	8,747	48,726	1,704	13,551	2,974	61,126	803	12,698
1986	5,391	33,889	1,637	55,978	2,642	43,415	642	5,728
1987	7,762	41,145	1,648	23,480	2,821	64,988	659	10,756
1988	7,896	43,905	1,691	25,055	2,488	63,361	716	10,244
1989	5,568	39,681	1,492	17,764	2,137	52,399	638	9,558

Year	Capsicum		Carrot		Knokhol		Raddish	
	Ext	Pro	Ext	Pro	Ext	Pro	Ext	Pro
1985	1,702	6,203	1,409	13,199	1,746	14,681	2,481	47,561
1986	1,476	5,343	1,222	10,484	1,100	9,078	1,830	19,174
1987	1,677	14,690	654	7,578	1,191	12,334	1,591	13,241
1988	2,259	10,708	1,053	15,276	1,192	18,663	1,577	14,765
1989	1,794	8,669	1,036	13,175	1,354	20,842	1,407	18,399

Source : Department of Agriculture & Department of Census & Statistics

Table 3. Extent Cultivated (HA) & Production (MT) of Vegetables in N'Eliya & Matale Districts From 1987–1990

	N'Eliya		Matale	
	Extent	Prod.	Extent	Prod.
1 9 8 7	5,077	5,729	4,939	42,899
1 9 8 8	5,385	6,729	4,520	45,417
1 9 8 9	4,750	5,386	4,227	44,087
1 9 9 0	7,361	8,035	3,153	25,189

Source : Department of Agriculture

Table 4a. Changes in cost of important inputs used in vegetable production 1989–91

	Cost (Rs.)			% increase	
	1989	1990	1991	89—90	90—91
Seed (100g)	183	209	236	14	13
Agro Chemicals (Cost/Ac)	167	193	217	16	12
Chemical Fert.(Cot)	203	398	438	96	10
Organic Manure(Lorry Load)	900	1,100	1,300	22	18
Wage rate(md)	65	70	80	8	14

Seed–average cost for 6 up country vegetables

Source : Results of the Surveys Conducted in N'Eliya & Matale Districts

Table 4b. Cost of Production (Rs/Ac) From 1989 to 1991

Crop	Total Cost			% Change	
	1989	1990	1991	89—90	90—91
Carrot	19,615	24,403	27,835	24.41	14.06
Leeks	31,982	41,756	48,032	30.56	15.03
Raddish	8,591	9,951	11,446	15.83	15.02
Beet	17,795	21,373	24,515	20.11	14.70
Cabbage	13,882	16,395	18,478	18.10	12.71
Beans	11,131	12,963	14,783	16.46	14.04
Bandakka	7,692	9,807	10,980	27.50	11.96
Snake Gourd	13,167	17,174	19,895	30.43	15.84
Pumpkin	3,641	4,755	5,251	30.60	10.43
Cucumber	3,439	4,292	4,761	24.80	10.93

Source : Results of the surveys conducted in N'Eliya & Matale Districts

Tables 5a. Vegetable Prices at Different Levels (Rs/Kg) Supplied to Kandy Market

Item	Bean	Leeks	Carrot	Beet	Cabbage	L.Tomato	S.Tomato
Farmgate Price	5.54	6.44	6.44	6.44	2.84	2.84	5.54
Wholesale Price	7	8	8	8	4	4	7
Retail Price	14	16	12	15	10	8	14
Producer Share in Consumer Rupee (%)	40	40	54	43	28	36	40

* Farmgate Price in N'Eliya and Wholesale and Retail Price in Kandy
Source : Results of the Surveys Conducted in Kandy & Colombo Markets

Table 5b. Vegetable Prices at Different Levels (Rs/Kg) Supplied to Colombo Market

Item	Bean	Leeks	Carrot	Beet	Cabbage	L.Tomato
Farmgate Price	9.69	5.33	5.93	5.91	3.39	6.09
Wholesale Price	11.50	6.66	7.33	7.30	4.50	7.50
Retail Price	17.20	12.60	14.60	14.83	10.08	16.50
Producer Share in Consumer Rupee (%)	56.3	42.3	40.6	39.9	33.6	36.9

* Farmgate Price in N'Eliya and Wholesale and Retail Price in Colombo
Source : Results of the Surveys Conducted in Kandy & Colombo Markets

Table 6a. Marketing Margins of Selected Vegetables Supplied to Kandy Market (Rs/Kg)

Item	Bean	Leeks	Carrot	Beet	Cabbage	L.Tomato	S.Tomato
Wholesale Gross Margin	1.46	1.56	1.56	1.56	1.16	1.16	1.46
Retail Gross Margin	7.00	8.00	4.00	7.00	6.00	4.00	7.00

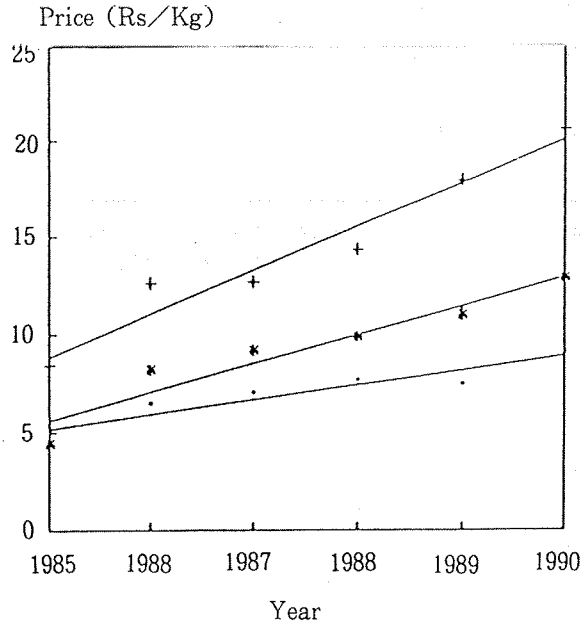
Source : Results of the Surveys Conducted in Kandy & Colombo Markets

Table 6b. Marketing Margins of Selected Vegetables Supplied to Colombo Market (Rs/Kg)

Item	Bean	Leeks	Carrot	Beet	Cabbage	L.Tomato
Wholesale Gross Margin	1.81	1.33	1.40	1.39	1.11	1.41
Retail Gross Margin	5.70	5.94	7.27	7.53	5.58	9.00

Source : Results of the Surveys Conducted in Kandy & Colmbo Markets

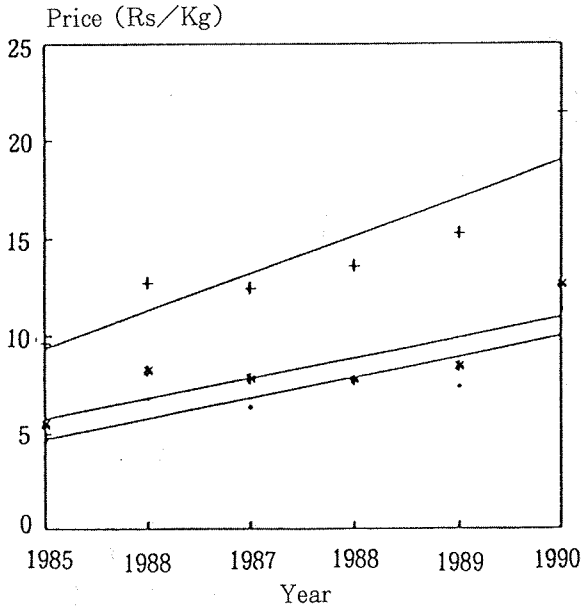
Figure 1 Trends in Prices, Carrot



—•— FGP —+— RP —*— WSP

FGP in N'Eliya & RP & WSP in Colombo

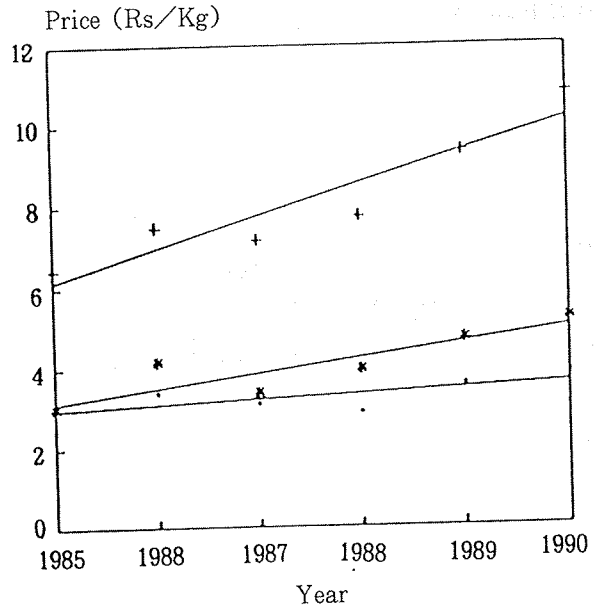
Figure 2 Trends in Prices, Leeks



—•— FGP —+— RP —*— WSP

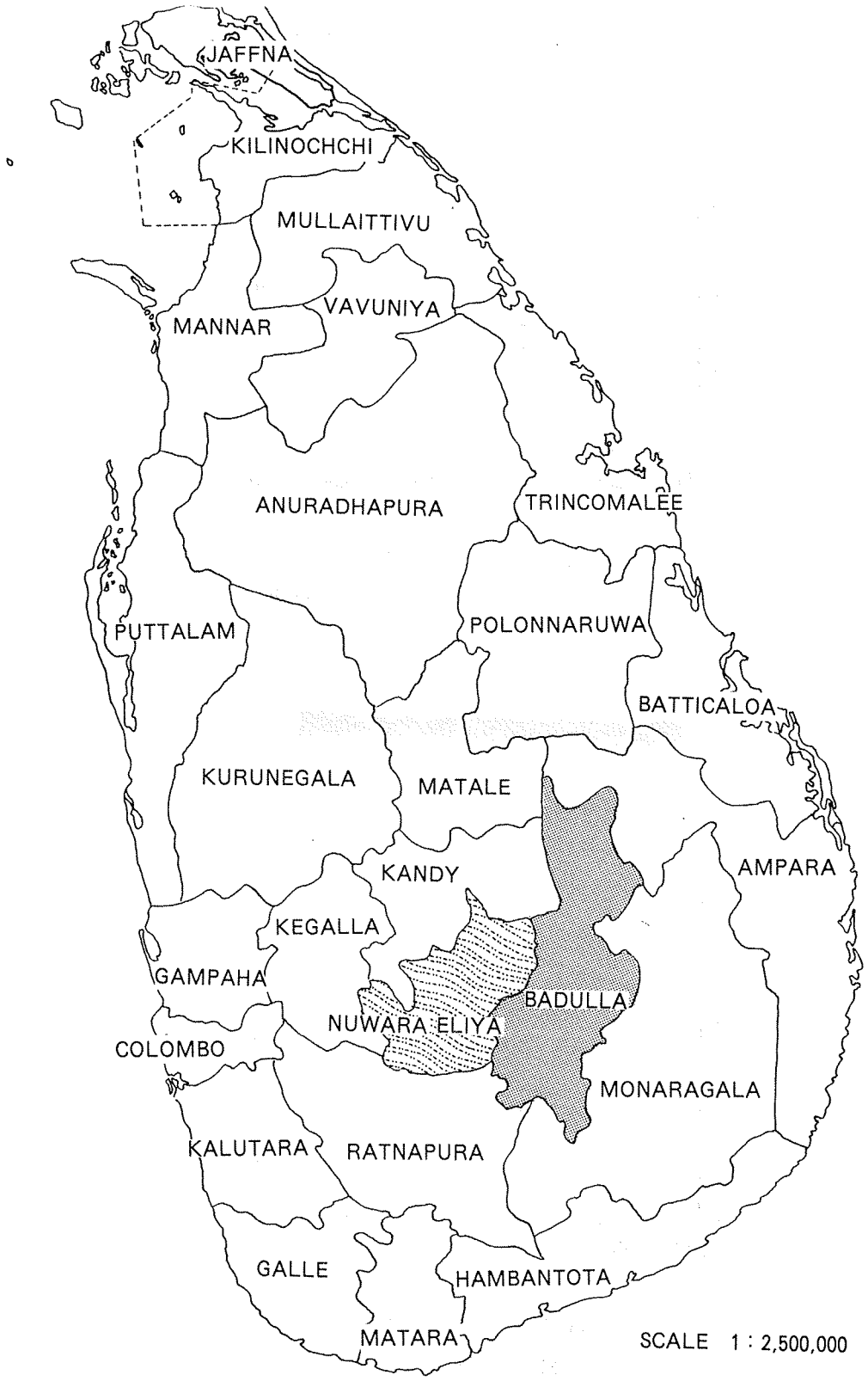
FGP in N'Eliya & RP & WSP in Colombo

Figure 3 Trends in Prices, Pumpkin



—•— FGP —+— RP —*— WSP

FGP in N'Eliya & RP & WSP in Colombo


JAFFNA
KILINOCHCHI
MULLAITTIVU
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MANNAR
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POLONNARUWA
BATTICALOA
KURUNEGALA
MATALE
KANDY
AMPARA
KEGALLA
GAMPAHA
BADULLA
NUWARA ELIYA
COLOMBO
MONARAGALA
KALUTARA
RATNAPURA
GALLE
HAMBANTOTA
MATARA
SCALE 1 : 2,500,000