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IMPACTS OF TRADE LIBERALIZATION AND MARKET REFORMS ON THE PADDY/RICE SECTOR IN SRI LANKA

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EXECUTIVE SUMMARY

Sri Lanka has rich experience in pursuing a variety of strategies to achieve food security. They range from the projectionist policies implemented mainly during 1948 to 1977, to open economic policies implemented since 1977. For the paddy/rice sector, the government continues to restrict rice imports due to fears that rice trade liberalization would have adverse impacts on poverty. On the domestic front, however, paddy procurement, milling and distribution are mainly done by the private sector. The production of paddy is mainly carried out by small farmers and, on an average, resource-use is found to be inefficient. While some researchers believe that the paddy-rice marketing system is competitive, many consider that it is characterized by a group of oligopolistic buyers. Finally, on the consumption side, the demand for rice, the staple food, is found to be price and income inelastic.

The overall objective of this research project is to assess the impacts of different types of government policies (pertaining to the domestic and external sectors) on the status of food security in the country, with particular emphasis on the paddy/rice sector. Specifically, the goals of this study are:

(a) To describe the present status of paddy production, procurement and distribution system in Sri Lanka, paying special attention to the involvement of government agencies and private sector.

(b) To document the evolution of domestic and trade policies affecting the above system showing the extent of liberalization over time.

(c) To examine Sri Lanka's position on the Agreement on Agriculture in the WTO and its likely impact on paddy/rice sector.

(d) To investigate the impact of rice trade liberalization and privatization of paddy procurement system on prices, supply of paddy, demand for rice, imports of rice and calorie intake at the national level.

(e) To investigate the impact of rice trade liberalization at the household level, and for various groups in the population, with a view to understand the implications for poverty.

(f) To investigate the likely impacts of elimination of oligopsony power of the paddy collectors on the well being of paddy farmers.

Following the introduction, the second chapter of the study provides a detailed background about paddy/rice in Sri Lanka from the point of view of production, storage, distribution channels and international trade. Some of the important information in the case of paddy and rice has been presented below:

(a) Paddy occupied the greatest land under agriculture of all the crops in 2001, contributing 15 percent to the agriculture sector GDP. Seventy percent of paddy farmers are smallholders (with a land area of less than one hectare) and the crop is heavily dependent on rainfall.

(b) After milling paddy is known as rice, which is the staple food in Sri Lanka, and the main source of calories in the people's diet.

(c) Due to the significance of the paddy sector in the Sri Lankan economy, governments have placed a great emphasis on increasing paddy production in order to achieve self-sufficiency. Large-scale irrigation projects and land development and settlement schemes were undertaken and the government also provided free irrigation water, fertilizer subsidies and guaranteed prices to farmers.

(d) Accordingly, productivity more than tripled from 1129 kg/hectare in 1970 to 3954 kg/hectare in 2001. At present, the country is 90% self-sufficient in rice, and imports have dropped to less than 10% of the level in 1970 although it has fluctuated over the years.

(e) The government was heavily involved in the marketing of paddy and rice up to 1977. In 1977, with the implementation of economic liberalization policies, private sector participation was allowed and as a result of competition there was a dramatic reduction in the government's share in marketing paddy to just 10% in 1995.

(f) With regard to storage, paddy is stored and the carry-over stocks are maintained for rice. Farmers sell about half the produce immediately to meet cash requirements and the balance is stored using a traditional system known as "Bissa", which tends to result in a high rate of post-harvest losses. Paddy is also stored by the collectors and millers.

(g) Storage facilities for rice belonging to the government are very poor at present. Due to the low keeping time of rice, storage by private wholesalers also tends to be only for short periods of about a month.

The third chapter traces the evolution of domestic and trade policies affecting the food procurement, storage and distribution system in Sri Lanka over time. They are chronologically enumerated below:

(a) In the 1930s and 1940s policies were directed at developing the dry zone for the cultivation of rice. However, the main problem associated with paddy was low yield due to the large number of smallholdings. Therefore, successive governments focused efforts on promoting rice production in order to achieve food self-sufficiency.

(b) The universal rice-rationing scheme (RSS) was initiated in 1942 to ensure equitable distribution of available food resources. The distribution system comprised consumer co-operative societies with an island-wide network of retail shops. There were two main sources of food to meet the RSS requirements – domestic procurement and imports. The government encouraged domestic food

production and strengthened the food procurement system in order to try to reduce the dependence on the international market and develop domestic agriculture.

(c) Internal Purchase System (IPS) – The government introduced this in 1942 to meet the demand for rice by the RSS.

(d) IPS was replaced by a scheme called "Marketing of Home Grown Foods" in 1948, in order to improve the functioning of domestic marketing channels.

(e) In 1961 the government introduced the Domestic Produce Purchasing and Storage Act of 1961, in response to the greater marketable surplus available with farmers. The purpose was to strengthen the role of co-operative societies in marketing.

(f) The 1960s also witnessed the setting up of several state enterprises to promote non-paddy agricultural activities. Examples are the National Milk Board, Ceylon Fisheries Corporation and Fisheries Harbor Corporation.

(g) Trend in international rice prices have tended to affect international procurements. During the three decades 1950-70 the government entered into bilateral trade agreements with China and Burma to secure rice in reliable quantities.

(h) From the 1970s onward, the government was confronted with high international rice prices and insufficient foreign exchange, and therefore had to procure more rice domestically.

(i) The Paddy Marketing Board (PMB) was established in 1971 in order to purchase more paddy through domestic channels. Disappointingly, despite the monopoly power vested with PMB, paddy procurement fell under the Guaranteed Price Scheme to 27% of total production in 1974 from 48% in 1971. The situation did not improve even though the government instituted measures such as the prohibition of storage of greater than a certain minimum amount of paddy by farmers, and also increased procurement price. This was on account of high prices

paid by the private sector for rice. The government also imposed rules whereby rice meals were to be substituted by non-rice meals in schools and public institutions.

(j) The Food Stamp Scheme was introduced in 1978, which aimed at targeting the poorest households in the country. Government intervention in promoting production and marketing of food grains dropped markedly after this scheme was implemented.

(k) The RSS was discontinued in 1979.

(l) After 1977 there was a marked change in policies toward greater economic liberalization and private sector participation.

(m) With respect to rice the changes involved allowing private sector companies to import rice from 1988 onward under a strict quota system.

In 1995 rice imports were liberalized and the licensing system was abolished and replaced with a tariff rate of 35%. This rate was reduced to 20% later that year. The tariff rate remained unchanged but waivers were granted at different rates in specified periods to curtail increasing prices in the domestic market due to production shortages in the market. In the area of procurement, PMB's procurement fell as low as 1.3% of total production for the period 1993-1995.

In the fourth chapter, the author examines Sri Lanka's position under the Agreement on Agriculture (AoA) and analyzes the likely implications. There are three pillars in the Agreement on Agriculture – market access, domestic support and export subsidies.

(a) Regarding market access provisions, Sri Lanka has bound nearly 99 percent of its tariffs on agricultural products including rice at 50% under the AoA, and it has 10 years from 1995 onward to bring down these tariffs. AoA requires member

countries to use import tariffs to restrict imports rather than quantitative restrictions.

(b) Sri Lanka does not have commitments with regard to domestic support and export subsidies, as these are based on the base levels of such support during 1986-88 and Sri Lanka did not have any trade distorting programs during this time. Due to commitments with the AoA Sri Lanka will not be in a position to implement any new subsidies.

(c) As a result, impacts of AoA on the paddy/rice sector will be negligible. If Sri Lanka wishes to implement new subsidy programs on paddy, they may be requested under the special and differential treatment.

In the fifth chapter the author uses a partial equilibrium model to assess the national level impacts of rice trade liberalization, treating Sri Lanka as a small net importer of rice. The details of the model are:

(a) The consumer side is represented by a demand system for cereals (of the AIDS functional form) and the producer side by a paddy supply function. The marketing functions are captured by an equation to link paddy prices and rice prices. Government procurement is considered as an exogenous variable affecting marketing functions. A tariff barrier and other border charges link the retail price of rice with the world market price of rice.

(b) The identities used in the model are as follows: Calorie intake from rice, wheat and millet were used to obtain total calorie intake. Rice production has been considered a constant proportion of paddy production, and rice imports have been considered as the difference between domestic production and consumption.

(c) Changes in trade policy are simulated by changing tariff levels and by eliminating other border charges that affect the retail price of rice, and changes in paddy procurement policy are simulated by changing the proportion of paddy procured by government institutes.

(d) The data used was obtained from food balance sheets and the Central Bank of Sri Lanka.

(e) The findings of the simulation exercises are as follows:

With trade liberalization, calorie intake increases, suggesting greater food security. Moreover, producer prices would fall, which would lower incomes of paddy farmers and reduce their capacity to purchase food. Since most of these farmers are small holders who are below the poverty line, the repercussions would be worse. The central question is whether the gains to consumers will exceed losses to producers and the underlying assumptions of the model suggest that they will. However, this result must be viewed with the caveat that the model does not study the how the impact of lower wages of the small holders would affect their consumption.

In the absence of government procurement, paddy prices will be further depressed, as private purchasers of paddy would exercise oligopsony power on paddy sellers/producers. This is because paddy sellers need to sell their produce immediately in order to obtain cash to meet repayment obligations and because they lack storage facilities. Therefore they are in a weak bargaining position. Moreover the market structure in the case of paddy is such that there are fewer millers of paddy than suppliers, which allows the millers to exert oligopsony power.

The policy recommendations that arise from this part of the study are that rice trade liberalization should be encouraged as a strategy to ensure food security, since it lowers prices and increases calorie consumption, both of which would be directly beneficial to consumers. The government should devise some method to monitor the oligospsony power that the millers are able to exert over the farmers.

In the sixth chapter, household level impacts of trade liberalization are assessed on various population groups. The analysis is based on the method used by McCulloch (2000), and the relative importance of rice and paddy in the total expenditure and income respectively of the particular population group is estimated in order to indicate the extent to which they will be affected by rice trade liberalization. The population groups are specified on the base of expenditure class, province, sector (rural, urban, estate), and by size of land holding. The policy shock introduced in this exercise is a 25% drop in rice and paddy prices. The findings are that there is a net gain to all the income groups, provinces and sectors. The biggest gainers are the lowest expenditure, those residing in the Northwestern province and those who are part of the estate sector, where the incidence of poverty is found to be the highest. Paddy farmers with relatively bigger holdings, on the other hand, are found to be negatively affected. Therefore, overall it appears from the results that rice trade liberalization is a pro-poor policy.

Finally, this study examines the impacts of trade liberalization in imperfectly competitive markets. The objective is to assess the impacts of rice trade liberalization in the presence and absence of market power. For this purpose, a partial equilibrium model is developed for the paddy market in Sri Lanka, under oligopsony, since the bargaining power of paddy suppliers is smaller than that of paddy buyers. Using this model, impacts of trade liberalization were simulated. Results reveal that losses to paddy producers due to trade liberalization can be minimized if oligoposony power can be eliminated simultaneously. Therefore, strategies to eliminate oligopsony power along with trade liberalization are recommended to achieve efficiency gains.

The study concludes by drawing policy implications, based on the analysis and findings of the study. Some of the important ones are that rice trade should be liberalized, as it leads to an increase in efficiency and net gains at the national level. (As mentioned earlier, this result should be interpreted keeping in mind the caveat of the model, which is that the impact on the consumption of the smallholders whose wages are adversely affected by trade liberalization has not been considered). A second policy implication is

that government procurement should continue but private sector participation in imports should be allowed. Finally, the findings of this study indicate that methods to help farmers combat the oligopsony power of millers should be provided. These may include provision of storage and credit facilities and strengthening of farmer organizations.

IMPACTS OF TRADE LIBERALIZATION AND MARKET REFORMS ON THE PADDY/RICE SECTOR IN SRI LANKA

Jeevika Weerahewa[1]

1. INTRODUCTION

1.1 TRADE POLICIES AND MARKET REFORMS IN SRI LANKA

Sri Lanka, classified as a lower middle income country at present, has rich experience in pursuing a variety of strategies to achieve food security. In early 1940, food subsidy and food ration scheme was used to achieve food security. Basic food items were provided to all individuals at subsidized prices and hence this policy can be considered as a universal price policy. The pressure on the treasury was very high with this policy and it was found that the needy people could not acquire the benefits of the policy. Between 1970 to 1977, The mechanisms used included adjustment of prices of rationed food, reduction of the entitlement of food rations and removal of tax payers from the ration scheme, restriction on imports, state monopoly on food imports, distribution of food through co-operatives and price controls.

Hence, in 1977, with the open economic policies, a food stamp program was implemented. This was targeted only to the poor, and it was a kind of income transfer program in which an income was transferred only to purchase a number of food items and kerosene. Food stamp program was converted to another program called *Janasaviya* in 1994, from which separate income transfers were provided for consumption and investment. *Janasaviya* program was converted to a similar program called *Samurdhi* by broadening the coverage.

Furthermore, from 1977 onwards, the policy was to increase the availability of food through liberalization of imports, allowing private sector to import and distribute,

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abolition of quota and ration system and removal of distortions in prices through elimination of subsidies and price controls on food items.

Due to commitments with global and regional trade agreements such as WTO, SAPTA, Indo-Lanka FTA, Pakistan-Sri Lanka FTA and due to commitments with donor agencies such as International Monetary Fund (IMF) and World Bank, Sri Lanka has been continuing to open up of its economy. Certain policies implemented through this policy package may or may not adversely influence the broad objective of achieving food security.

For paddy/rice sector, the government continues to restrict rice imports considering rice trade liberalization has adverse impacts on poverty. However, paddy procurement, milling and distribution are mainly done by the private sector. This study focuses on the impacts of different types of policies implemented by the successive governments in Sri Lanka, on the status of food security, with a special emphasis on paddy/rice industry.

1.2 PREVIOUS STUDIES

Among the studies conducted in Sri Lanka on food security, many have attempted to measure them at the national level (Sanderatne, 2001; Kelegama, 2000), and there is a good understanding about the food security issue at the national level. The poverty assessment reports provide a fair understanding about the basic needs of different types of households by region, employment, education, ethnicity, irrigation etc (Household Expenditure and Income Survey of the Department of Census and Statistics, Sri Lanka Integrated Survey of the World Bank, Household Surveys of the International Water Management Institute). Dietary and Health Survey of the Department of Census and Statistics provides some statistics of the individual food security.

Studies conducted to assess the production efficiency of rice farming state that it is a relatively an inefficient enterprise (Amarasinghe, 1974; Karunaratne and Herath, 1989; Abeyratne *et al.,* 1990; Shilpi, 1995; Kikuchi *et al.,* 2000; Rafeek and Samarathunage, 2000) and income from paddy farming is very small (Weerahewa *et al.,*

2003). Studies conducted to evaluate consumption aspects state that rural sector is less price responsive than urban sector, while the rural sector is more responsive to expenditure than the urban sector (Tudawe, 2002), and there are significant differences among the elasticity estimates between participants and non participants of food aid (Bogahawatte, 1992). Though paddy and rice marketing is a crucial aspect, relatively a few studies have been carried out to assess marketing efficiencies. While some argue that it is competitive (Ellis *et al.,* 1996; Harrison, 1995), others found that it is characterized by oligopolistic buyers (Rupasena, 2002; Dharmaratne and Hathurusinghe, 1999). The degree of protection given for the rice industry was evaluated Epaarachchi *et al.,* (2002) using nominal and effective rates of protection and by Ekanayake (2003) using a partial equilibrium model. They reveal that producers are protected at the expense of consumers. Bogahawaate (1983), found that the increase in production of paddy due to increase in guaranteed price results in 47 percent growth in the long run paddy purchases. Gunawardena and Oczkowski (1992) also state that the continuation of the guaranteed price scheme appears to play a positive role in providing incentives to producers.

1.3 OBJECTIVES

The overall objective of this study is to investigate the effects of domestic policies that relate to agricultural trade liberalization and market reforms on national and household food security in Sri Lanka with special emphasis on paddy/rice sector. Specific objectives of this study are:

(a) To describe the present status of paddy production, procurement and distribution system in Sri Lanka, paying special attention to the involvement of government agencies and private sector.
(b) To document the evolution of domestic and trade policies affecting the above system showing the extent of liberalization over time.
(c) To examine Sri Lanka's position on the Agreement on Agriculture in the WTO and its likely impact on paddy/rice sector.

(d) To investigate the impact of rice trade liberalization and privatization of paddy procurement system on prices, supply of paddy, demand for rice, imports of rice and calorie intake at the national level.

(e) To investigate the impact of rice trade liberalization at the household level, and for various groups in the population, with a view to understand the implications for poverty.

(f) To investigate the likely impacts of elimination of oligopsony power of the paddy collectors on the well being of paddy farmers.

1.4 ORGANIZATION

The report is organized as follows. Chapter 2 presents the present status of paddy production, procurement and distribution system in Sri Lanka. Chapter 3 shows the evolution of trade policies and market reform policies affecting agricultural sector in Sri Lanka. Chapter 4 shows the commitments with the WTO to further liberalize agricultural markets. Chapter 5 assesses the impacts of rice trade liberalization and market reforms performed to privatize paddy procurement on calorie intake at national level. Chapter 6 assesses the impacts of rice trade liberalization on poverty at regional levels. Chapter 7 assesses the impacts of oligopsony power on income from paddy farming at national level. Report ends with a chapter on summary, conclusion and suggestions for further research.

2. PADDY PRODUCTION, PROCUREMENT AND DISTRIBUTION SYSTEM IN SRI LANKA

2.1 INTRODUCTION

In Sri Lanka, paddy sector plays an important role. In the year 2001, it has contributed 15 per cent to the agriculture sector GDP and 3.1 per cent to the total GDP. Paddy occupies the largest land area under agriculture and in the year 2001, the gross extent sown was 798,000 ha. Generally, paddy occupies about 45 per cent of the total permanent agriculture land holdings. A majority of the paddy farmers, 70 per cent, are smallholders with a land area of less than 1 ha. Paddy is cultivated during two seasons, maha and yala. Maha (October to March) usually accounts for about 65 per cent of the annual production and the rest 35 per cent coming from the yala crop (April to September). Normally paddy is planted between 750,000 to 850,000 ha annually, of this maha accounts for 500,000 to 550,000 ha and yala accounts for about 300,000 to 350,000 ha. Two thirds of the paddy extent is grown under irrigated conditions and the paddy crop is heavily dependent on rainfall.

After milling, paddy is known as rice. Rice is the staple food in the country and is the main source of calories in the Sri Lankan diet. The average per capita consumption is about 300 grams of rice and it provides about 1,050 Kcal per day, meeting 45 per cent of the per capita protein requirement. Given the significance of the paddy sector in the Sri Lankan economy, all successive governments have placed a grater emphasis on increasing paddy production in order to achieve self-sufficiency. Therefore, a larger amount of investments were geared towards the improvement of the paddy sector. Large-scale irrigation projects, land development and settlement schemes, free provision of irrigation water, fertilizer subsidies and guarantied prices were some of the investments made in order to improve the sector performance. These have improved the paddy cultivation in the country and at present country are enjoying a self-sufficiency level of about 90 per cent.

2.2 LOCAL PRODUCTION

Although paddy is grown in both seasons — maha and yala — the major season is maha. Paddy production during maha is around 60 per cent of the total paddy production. Paddy is grown in almost all the districts but a significant contribution is made by Kurunagala, Anuradhapura, Polonnaruwa, Monaragala, Hambantota and Ratnapura districts. Table 1 below shows paddy production statistics in Sri Lanka and it reveals that paddy production has significantly increased over the period 1970 to present. According to the statistics it is evident that this increasing paddy production is a result of improvements in the yield per hectare and the contribution by the extent sown is minimal. Government support schemes like provision of improved varieties, provision of fertilizer at a subsidized rate, extension programs like "yaya" demonstrations and also attractive prices during a given year could be considered as positive influences in enhancing the yield levels. Reasons behind the fluctuations in the extent sown could be considered as the weather and security conditions in the paddy growing areas.

Table 1—Rice Production and Imports

Year	Gross Area Sown ('000 Ha)	Production ('000MT)	Yield (Kg/Ha)	Imports ('000MT)	Self Sufficiency Ratio
	Rice	Rice	Rice	Rice	Rice
1970	759	969.6	677.4	526	64.83%
1975	696	692.4	1362	457	60.24%
1980	845	1279.8	1756.2	167	88.46%
1985	882	1596.6	2079	182	89.77%
1990	857	1522.8	2071.8	172	89.85%
1995	915	1686	2121	9	99.47%
1996	749	1236.6	2107.8	341	78.38%
1997	730	1343.4	2170.8	306	81.45%
1998	848	1615.2	2180.4	168	90.58%
1999	896	1720.8	2203.2	214	88.94%
2000	878	1716	2313.6	15	99.13%
2001	798	1617	2372.4	52	96.88%

Source: Central Bank of Sri Lanka, Various years.

2.3 RICE IMPORTS

Even though the local paddy production has significantly increased over the years, Sri Lanka has to import a sizeable quantity of rice to meet the local demand. According to table 1, it is evident that the quantity of rice imported into the country has fluctuated significantly over the years. This is mainly due to the changing policy structures that are formulated purely to protect the domestic paddy producers. These policies have influenced the quantity of grains imported and the power of importing.

Until 1990, the Food Commissioner's Department (FCD) had the monopoly power in rice imports but later this monopoly power was given to the Co-operative Wholesale Establishment (CWE). This government monopoly in importing rice continued until 1993. However, in 1993, the private sector was allowed to import rice under licenses. In 1996, this licensing scheme was also removed and allowed anyone to import rice at anytime at a specified duty of 35% (Rupasena and Ravichandran, 2000). In 1997, the rice trade experienced a considerable degree of uncertainty and prices varied excessively during the year as trade policy relating to rice remained unpredictable (Central Bank of Sri Lanka, 1998). Even with a supply shortage in 1997, this unpredictable policy environment prevented the private sector importers from importing rice. Only for the fourth quarter of 1997, a duty wavier was granted for a short period enabling more rice imports. However, due to this uncertainty no buffer stocks were maintained during 1997 by the Bondsmen.

Of the 168, 000 MT imports of rice in 1998, 75 per cent of the imports were imported during the month January. This is mainly due to the duty wavier introduced to reduce the escalating price of rice in the domestic market. However, this duty wavier did not continue during the latter part of 1998, as the government's main aim was to protect farmers' interests by stabilizing the paddy prices at a reasonable level. Rice imports during 1999 amounted to be 214,000 MT. Over two thirds of the imports were made during the months November and December. During this period, a partial reduction of duty on imports has granted with a view to stabilize domestic rice prices. The reduction

of import duty on rice was from 10 to 35 per cent and was effective from 23 October 1999 to 31 December 1999.

In July 2000, the licensing scheme was re-imposed on the import of rice and continued until 22 November 2001 (Central Bank of Sri Lanka, 2002). The government once again intervened in the market and allowed the private sector and the CWE to import 60,000 MT of rice on a duty free basis. This decision was taken due to escalating rice prices in the market that caused as a result of shortfalls in paddy production. Of the imports, CWE was allowed to import 30,000 MT, while the balance was equally distributed among 15 private sector importers. However, only the private sector importers had imported the full quota of 30,000 MT of rice while the CWE had imported only a portion of the allocated quantity before 10 December 2001. After 10 December to 31 December 2001 the duty rate applicable for importing rice has changed from duty free to 50 per cent of the normal duty.

2.4 PADDY/RICE MARKETING

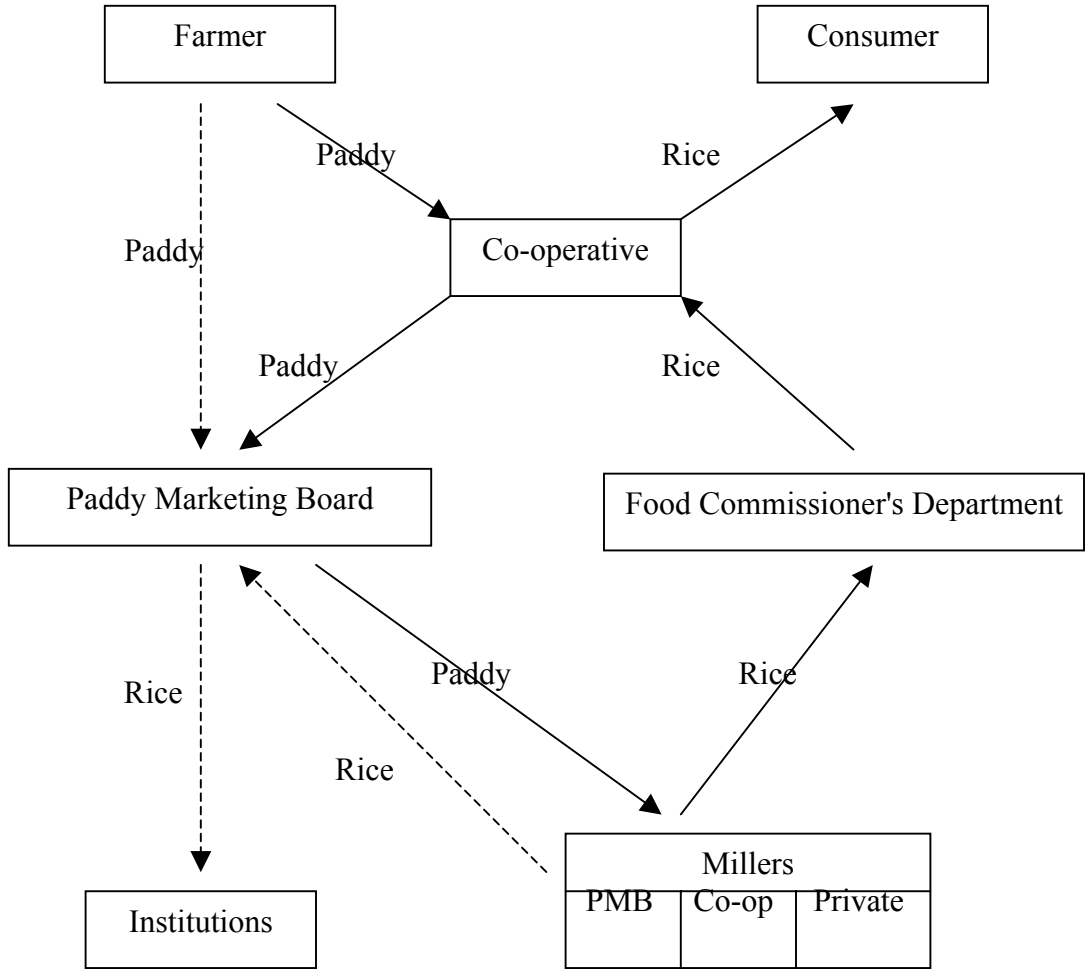
The concept of marketing covers all the activities in the flow of product from the point of production to the point of purchase by the consumer. In this process, a number of persons and organizations are involved and perform different functions like assembling, financing, grading and standardization, transporting, packing and sorting, processing and distribution. In Sri Lanka, more than half of the production of paddy comes to the market as the surplus. In marketing this surplus, both the private and the government sector institutions play a role. However, the level of operation by these groups has changed significantly over the years.

Since 1948, paddy has been purchased by the government under a Guaranteed Price Scheme (GPS). Up to 1973, the price under this GPS was higher than the c.i.f. value of the paddy equivalent of imported rice. However, this price structure was reversed in 1974 (Yoshimura *et al.,* 1975). With this reversal, collection of paddy by the government organizations started to decline. Before January 1972, functions related to paddy marketing were performed by the Department of Agrarian Services. However, in

January 1972, these functions were taken over by the Paddy Marketing Board (PMB) that was formed in 1971. The PMB was set up by an Act of parliament (No. 14, 1971) as the sole marketing outlet for paddy in Sri Lanka. This act allowed the PMB or their agents to have the sole authority in collecting paddy from the farmers, store, process and distribute the milled rice to the Food Commissioner's Department (FCD) in order to distribute to the consumers under the rice rationing scheme. During 1970s, rice was marketed principally through the government organizations. The co-operatives collected the paddy from the farmer on behalf of the PMB, which hired private millers to process the paddy. The millers handed over the rice to FCD, which in turn issued it to the co-operatives for distribution to the consumers on ration. Even though this could be considered as the legal channel in marketing rice at that time, there were illegal channels for marketing rice as well. Both the legal and illegal channels existed during the mid-1970s are shown in figures 1 and 2. Apart from the above marketing functions; collection, milling and distribution of paddy/rice, the PMB also involved in maintaining a "Buffer-Stock Scheme" for rice by using its regional warehouses in each region. This was primarily carried out with an aim of stabilizing rice prices in the market.

The role of government in marketing paddy/rice was changed with the introduction of economic liberalization policies in 1977. In 1978, the PMB act was amended and allowed the private sector to involve in marketing rice based on competition. As a result of the intense competition, there was a dramatic reduction in the government's market share in purchasing paddy (Table 2). The government sector involvement mainly confined to farm and at retail levels. As in the past, the Agrarian Service Centers (ASC), PMB centers and Multipurpose Co-operative Societies (MPCS) purchased paddy from farmers under the GPS. The FCD was involved in distributing rice that was milled by the PMB. This public sector marketing channels of rice in the mid-1980s are shown in figure 3.

Figure 1—Legal Channels of Rice Marketing during the Mid-1970s

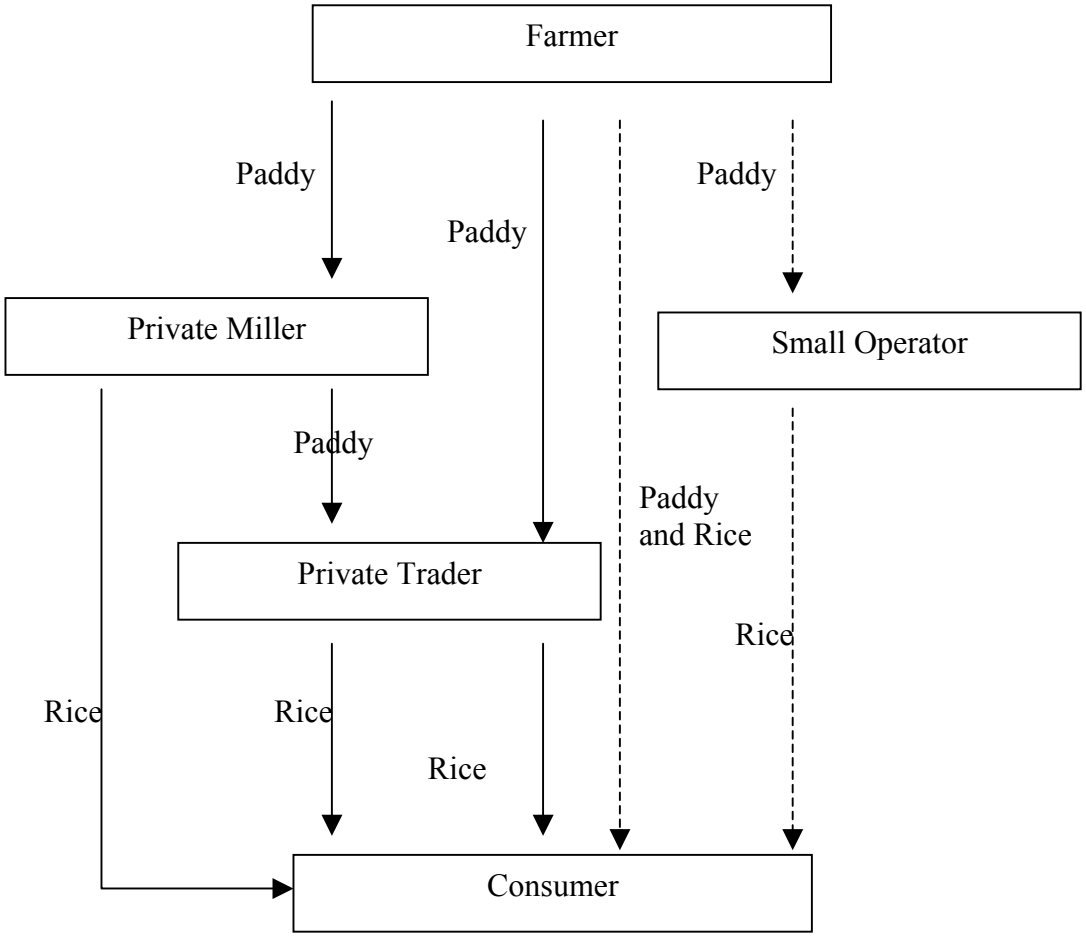


Note: Main flow ⟶ Very small flow ⇢

Institutions are referred to as armed services, hospitals, hotels and eating-houses.

Source: Yoshimura *et al.,* 1975.

Figure 2—Illegal Channels of Rice Marketing during the Mid-1970s



Note: Main flow ——→ Very small flow - - - - - - - - - - →

Small operators are referred to as sellers of rice at public places as a livelihood.

Source: Yoshimura *et al.,* 1975.

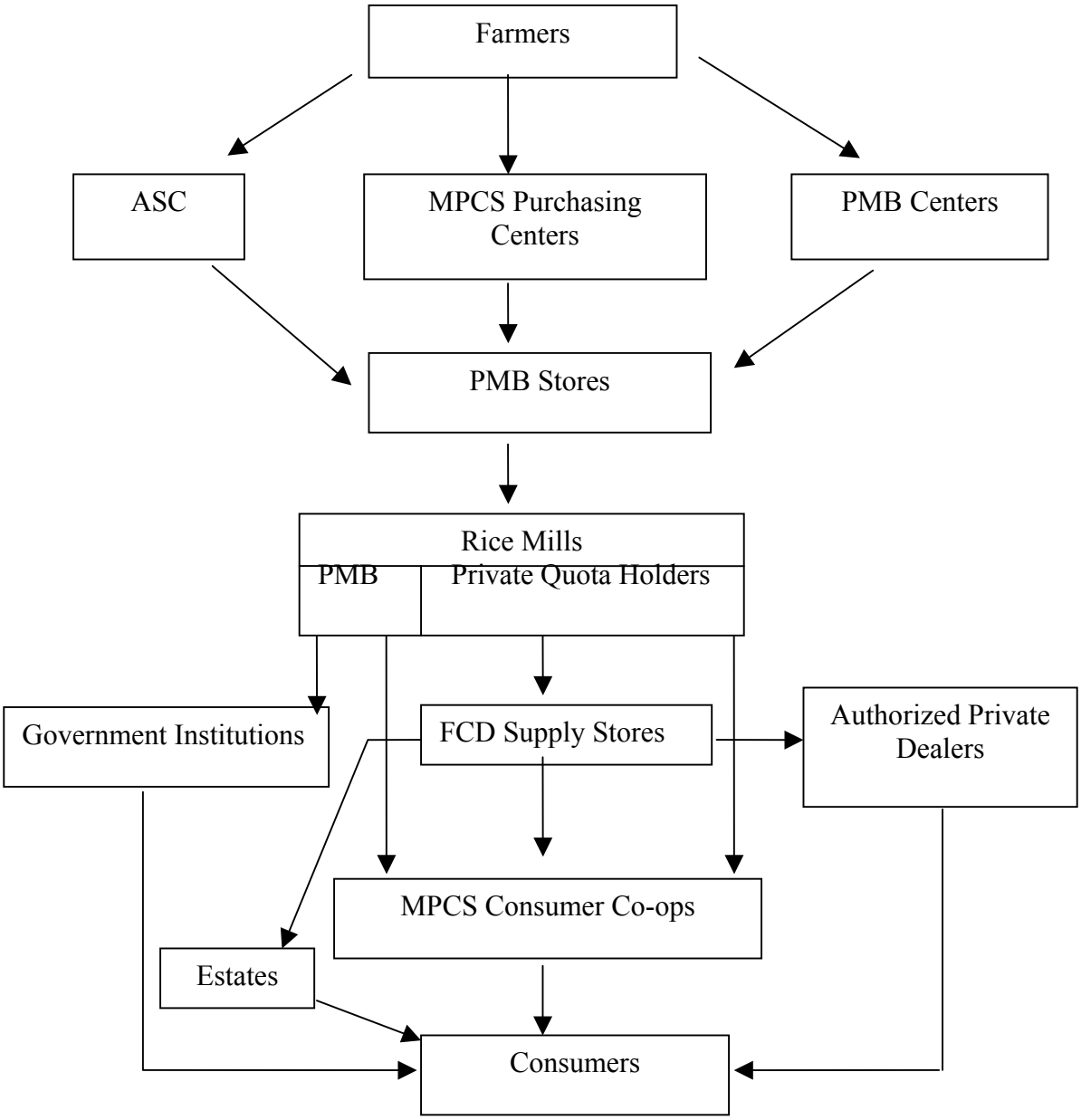
With the economic liberalization, the private sector started to perform nearly 80 per cent of the marketing functions in the rice marketing system in Sri Lanka. At the farm level, a number of private participants involve in purchasing paddy. They are the assembly agents, brokers, small operators and rice millers. These assemblers are the first buyers of paddy and are often referred to as collectors. Some of them are paddy producers, input suppliers, and grocery traders. Many paddy assemblers are located in the paddy producing areas and only a very few hold stocks due to lack of storage facilities and finance. These assembly agents distribute the stocks of paddy to millers who are located in different parts of the country. Some of these millers stock paddy and mill it at a later stage. The amount of paddy milled usually depends on the prices of rice.

Table 2—Market Share of the PMB

Year	Total Paddy Production ('000 MT)	Paddy Purchases by the PMB ('000 MT)	Percentage Market Share of the PMB
1972	1305	551	42
1975	1158	242	21
1977	1681	513	31
1980	2137	212	10
1985	2487	324	13
1990	2538	31	1.2
1995	2810	282	10

Source: Central Bank of Sri Lanka, Various years.

Figure 3—Public Sector Marketing Channels



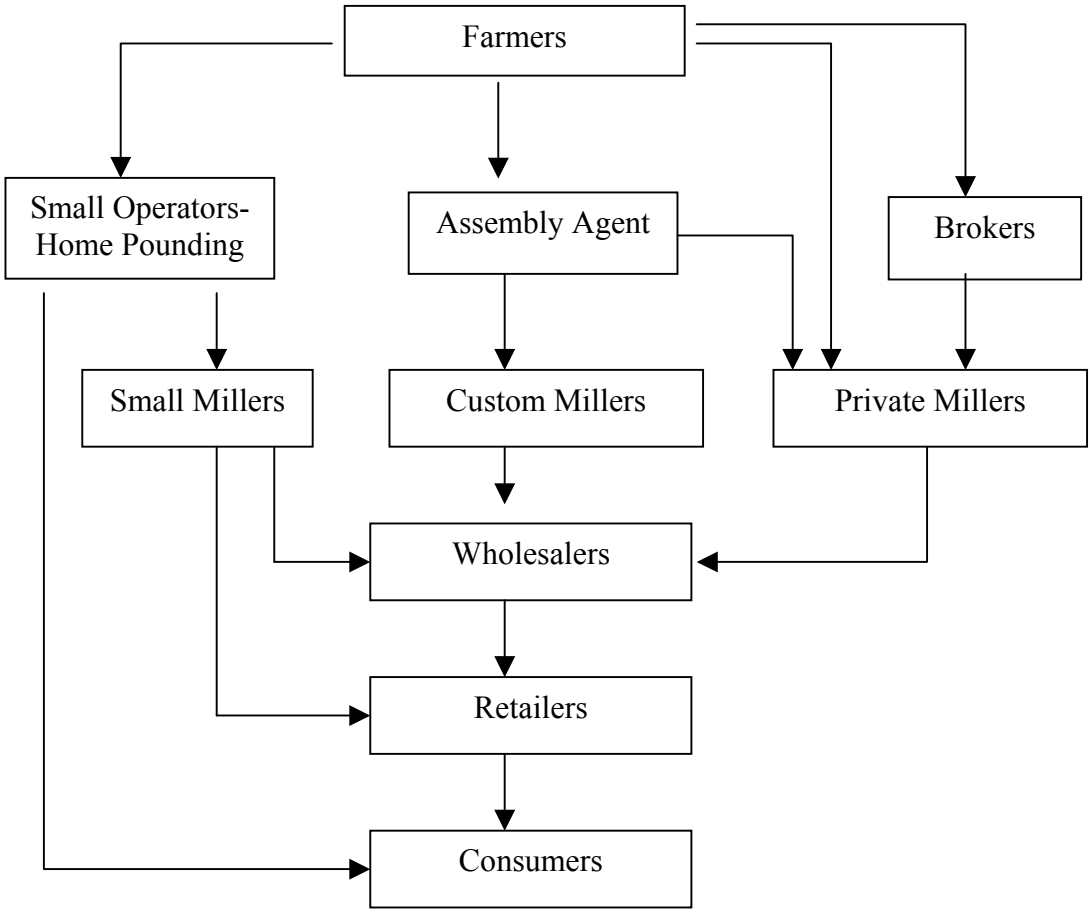
Note: ASC refers to the Agrarian Service Centers and MPCS refers to the Multipurpose Co-operative Societies.
Source: Somaratne, 1987.

The wholesalers in the Colombo market play a major role in the distribution channel. They operate under a commission basis as well as on a direct buying system from millers and sell rice to retailers. In addition to the distribution function, the wholesalers are also efficiently involved in making advance payments to suppliers, bulk breaking to match the demand, keep suppliers and distributors informed about the prices, make trading finance (Somaratne, 1987). The Colombo wholesale market handles about 60 per cent of the total production of rice. After rice stocks reach the wholesale market, wholesalers sell rice to retailers in every part of the country. This private sector marketing channel that initiated after the economic liberalization policies are shown in figure 4.

In the beginning of 1990, PMB had taken a decision to purchase paddy at competitive prices above the guaranteed price. Along with that decision, PMBs involvement in purchasing paddy showed a six-fold increase to 31,000 MT in 1990 over the purchases of 5 MT in 1989. The guaranteed price of paddy was revised upward in 1993 to Rs. 155 per bushel and remained unchanged. However, PMB has not actively participated in purchasing paddy since 1996. In 1997, PMB has not purchased any paddy as the State relied farmer organizations to purchase paddy. These farmer organizations have also utilized some of the PMB stores in storing paddy. The CWE entered the paddy marketing activities during the 1996/97 maha season for the first time. These two organizations, the CWE and the farmer organizations continued to purchase paddy and helped to stabilize paddy prices. MPCSs purchase paddy through the co-operative shops located island wide hence, their network is bigger than that of the CWE. The number of MPCSs that were involved in paddy purchasing has increased from 55 in 1996/97 to 101 in the year 2000. Similarly, the number of co-operatives involved in paddy purchasing increased from 210 in 1997 to 608 in the year 2000 (Rupasena and Ravichandran, 2000). Even though, the purchases by these organizations have increased from 1997 to 2000, the amount purchased is insignificant compared to that of the total production. In addition to the above government-based organizations, MARKFED (Sri Lanka Co-operative Marketing Federation Ltd.) has also started purchasing paddy from 1998. MARKFED

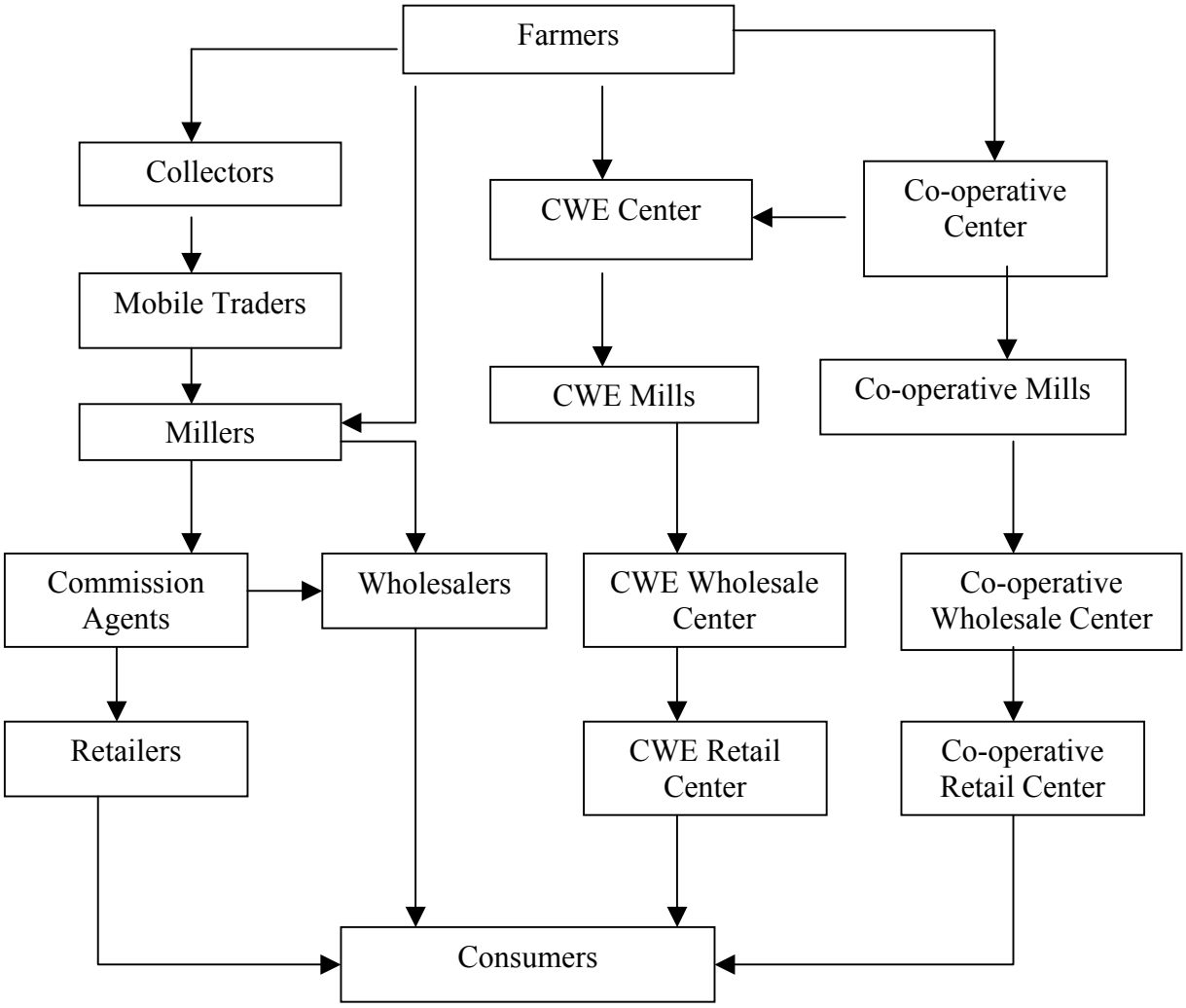
has purchased samba varieties directly from the farmers in Polonnaruwa, Hingurakgoda and Thalawa areas. It also owns a mill with a capacity of 20,000 Kg per day and the rice is sold through its wholesale and retail outlets. However, it has purchased only 1,290 MT in the year 2000 (Rupasena and Ravichandran, 2000). This shows the greater involvement of the private sector in marketing paddy/rice. The present paddy/rice marketing system is shown in figure 5.

Figure 4—Private Sector Marketing Channels



Source: Somaratne, 1987.

Figure 5—Present Marketing Channels for Paddy and Rice



Source: Rupasena and Ravichandran, 2000.

2.5 STORAGE

In Sri Lanka, paddy is stored and carry over stocks are maintained for rice. Farmers, collectors and millers store paddy. Most of the paddy farmers sell about 50 per cent of the marketable production soon after the harvest for immediate cash requirements and the balance is stored for later sales (Rupasena and Ravichandran, 2000). Some farmers store paddy on farm by using the traditional "Bissa system" but this system is considered to be ineffective as it causes more post-harvest losses. A majority of the large millers own storage facilities hence, they store paddy and mill at a late stage. Even though in the past, PMB has played a dominant role in storage by owning a number of high capacity stores in storing paddy now they are in the hands of the private sector. Therefore, at present the government sector has very poor storage facilities. Many participants in the marketing channel store paddy but the storage of rice is limited due to its low keeping quality. Therefore, wholesalers in the Colombo market store rice only for about a month.

3. EVOLUTION OF DOMESTIC AND TRADE POLICIES AFFECTING PADDY PROCUREMENT, STORAGE AND DISTRIBUTION SYSTEM IN SRI LANKA

3.1 INTRODUCTION

This chapter discusses the evolution of government policy in Sri Lanka with respect to paddy procurement, storage and distribution system. It discusses government policies of promoting agriculture and that of providing basic needs. It then reviews the linkages between the two basic policies discussed above and the evolution of the marketing and procurement policy during different time periods in order to meet the needs of respective governments. Since the independence government policy in Sri Lanka on food marketing is clearly identifiable into three policy regimes: a) the regime of promotion of domestic production and marketing in a less regulatory manner, b) the highly regulated domestic marketing and c) the liberalized regime. The main discussion

of the chapter revolves around paddy while the policies on other agricultural commodities are discussed when appropriate.

3.2 GOVERNMENT POLICIES IN SRI LANKA

3.2.1 Policies to Promote Agricultural Production

Government strategy in the promotion of domestic agriculture during the last century, especially after legislation reforms in 1931 was to develop the dry zone of the country. By this time wet zone of the country was characterized by high population densities and much of the available cultivable land area was either used by commercial plantation agriculture or by rice farming in small fragmented holdings thus bringing new land into cultivation impossible. In contrast, the dry zone possessed abundant land and was sparsely populated. Agriculture in the dry zone was confined to villages supported by small irrigation tanks and shifting cultivation. The potential in developing the area existed as large-scale ancient irrigation schemes were hardly in use. Many thousands of small-scale schemes that needed many small investments were also abandoned by that time due to lack of population and infrastructure. Investments in irrigation were essential in dry zone settlement schemes as water was the most important input in bringing otherwise less productive land masses into productive lands. Promotion of peasant colonization in the dry zone was thus a logical strategy to generate employment and to increase food production.

During the 1930s and 1940s the emphasis was on restoration of abandoned systems. Development cost per unit of land was less due to meager costs in irrigation head-works development. Land improvement and human settlement incurred were important as there were hardly any facilities to attract people to live in the dry zone. Government investments in restoring large irrigation systems and subsequent improvements in the quality of life in the dry zone also made the impetus for voluntary migration of people from the wet zone to settle in abandoned small scale systems and in newly established townships in the dry zone. Rice was the main commodity grown in the newly developed land.

Average yield of paddy in Sri Lanka in 1944 is estimated at 0.6 Mt per ha. More than 60 percent of the operational paddy holdings in 1946 were below 0.4 ha with average holding size of about 0.5 ha. (DOCS, 1951). Low yield and large number of small holdings made the marketed output of rice small. Thus imported rice was the main source of rice for distribution in the urban districts where majority of the population had no access to own rice. Small volume of marketed output was easily handled by the domestic free market forces and thus a need for government intervention in procurement was not a significant issue. Much of the demand in the market was met with rice imports from Burma which was also a colony of the British. All successive governments seriously proclaimed the food self sufficiency as a long term policy objective. Emphasis on promoting rice production was a key component in the government programs. Edirisinghe and Poleman (1977) argued that around 90 percent of the pre-World War II rice supply was met through imports. The picture changed drastically as investments in irrigation and agriculture continued. Rice imports accounted only to 10 percent of the total rice availability in early 1980s.

3.2.2 Government Policy towards the Provision of Basic Needs

As discussed above, meeting the demand for rice through imports would have continued without much difficulty if the country did not face acute food shortages during the World War II. Since the onset of the war, the colonial government experienced a disturbed supply of rice from the east and the resultant food shortage prompted the government to regulate the food distribution and storage system. The universal rice rationing scheme (RSS) was initiated in 1942 to ensure equitable distribution of available food resources. Consumer co-operative societies with an island-wide network of retail shops provided an efficient base to implement the system. In this scheme consumers were expected to purchase their rations through designated shops.

Although domestic food supplies were expected to cater to a substantial share of the demand, the production and the marketable surplus of farmers was low and domestic rice procurement had not organized into an efficient market system. This situation provided pre-conditions to develop the domestic agriculture, especially the rice sector.

Drive of domestic food procurement was also necessary in order to improve the food available for distribution through the rationing system. However, low productivity remained as the major obstacle to increase domestic production and production promotion programs had little success. By the time of the independence in 1948 the burden on rice imports due to the war had reduced. The government however, continued the RSS thus the demand for rice from the government continued until 1979 when it was discontinued. Food Stamp Scheme was the successor to the RSS and the main difference between the later and the former programs was that the former was targeted at the poorest households of the economy. The policy of the government then shifted to focus on food security of the country through closely monitoring the domestic production and imports.

RSS and the Government Demand for Rice

The government acted as a purchaser of rice while the RSS was implemented. The quantity demanded of rice by the government varied as the RSS was amended several times with respect to its targeted population and the quantity of rice eligible by different segments of the society. The quantum of rice per person issued per week under the RSS was two measures until 1966. The charge per measure was Rs.0.60 per measure till 1954 and was Rs. 0.25 till 1966. The system was revised in 1966 to issue only one measure of free rice. As a result, the quantity of government demand generated through RSS reduced by 50% while the total demand for rice in the country remained around the same. The United Front, a coalition among three political parties formed to contest for the 1970 general election brought a key political promise to offer two measures of rice to each individual. Once succeeded this was fulfilled by revising the ration scheme accordingly. The additional one measure was priced at one rupee per measure. Although income tax payers were not eligible to the free ration, the resultant decrease in demand for rice from the government was negligible as the income tax payers were only a small proportion of the population. Income tax payers however were eligible for the total quantum of rationed rice equally priced as that of non income tax payers. In sum, the new system demanded a large amount of rice to be distributed through the government channels. Revision of the ration quantity in 1974 reduced the government demand while are increase in 1976

increased the demand. Similarly, discontinuation of the RSS in 1979 brought the end the demand for rice from the government.

The government theoretically had two sources of supply to meet its demand for rice for the RSS. i.e through imports or through domestic procurement. During the pre-independent era as well as for so many years from the independence, insufficient marketable surplus that arisen due to low yield and nature of small holdings was a constraint in realizing the domestic sources for supply of rice. On the other hand it was easy for the government to procure rice in the international market and distribute it through the designated co-operative outlets. However, the government's policy on the balance of domestic purchases and international purchases was a reflection of several criteria including its commitment to develop domestic agriculture and its access to national and international procurement of rice. Dynamics of the international rice market influenced the government to shape its course of action to a larger extent. The government had enough foreign exchange reserves during the early years to be used in its international procurements. As international rice prices declined in early 1960s the government had the bargaining power to enter into bilateral trading agreements with China and Burma to secure rice in reliable quantities. During the three decades 1950-70 the government had procured around 50 percent of the annual rice requirement from China and Burma. In the early 1970s as the demand for rice increase, the government simultaneously had to face the international rice crisis. Due to foreign exchange constraints and historically high rice prices in the world market, it was essential to procure more rice from the domestic market, which necessitated the establishment of the PMB. Withdrawal of the government from the RSS made extensive procurement infrastructure redundant and was the rationale for gradual decline of the importance of PMB.

3.2.3 Domestic Policies to Promote Production and Marketing

The history of government intervention in domestic procurement runs back to 1942 when the government introduced the Internal Purchase System (IPS) as a tool to meet demand of rice for RSS. Lack of voluntary sales by farmers necessitated in August

1943 to impose a rule to make it compulsory for every cultivator to sell two bushels and one bushel of paddy respectively from the maha and the yala harvests. The main reason for this can be understood as improving procurement as the government's access to international procurement was delicate.

The IPS was replaced in 1948 by a scheme " Marketing of Home Grown Foods". The scheme was administered by the Commissioner of Marketing and was aimed at improving the functioning of the domestic marketing channels. Foreign exchange reserves during this period were at satisfactory levels. Thus the government if desired could continue importing rice. However, the government had a futuristic vision in principle to promote domestic agriculture. Other than the promotion of production through several means it was in the view that marketing is also an important aspect. The government appointed a special committee to investigate into the marketing system and recommend the government appropriate policy measures. Upon the recommendations of the committee the guaranteed price scheme (GPS) for paddy and a number of other food crops was introduced in 1948. The initial policy objectives of the GPS scheme were, a) to assure the producers (of) fair prices and ready market for their produce, b) to stimulate the production of food crops consumed in the country and c) to replace food imports by locally produced foods with the long-term goal of food self sufficiency. Several government departments such as the Department of Agrarian Services, Department of Marketing Development and the Department of Cooperative Development were responsible in implementing the scheme. During the next few years, average operational land holding size began to increase due to larger holdings in newly developed dry zone settlements and irrigation improved the quality of land and thus contributed to the yield increase. National average yield based on planted area basis is estimated as 1.0 Mt per ha in 1951 (Aluvihare and Kikuchi, 1991). However, prospects of improving yield through increased fertilizer application was meager as the rice varieties grown were not fertilizer responsive.

During the first ten years since the independence, other than pursuing the strategy to develop land settlement schemes the governments took several measures to reduce the

uncertainty attached to rice farming which in consequence was a constraint in getting better yields. Paddy Lands Act of 1958 was aimed at bringing secure tenure to a large number of farmers. The government also vigorously promoted rice breeding and improvement program which produced several successful varieties belonging to the Old Improved Varieties category. During the early 1960s the government was running into low foreign exchange reserves and shifted towards an import substitution strategy in both industrialization and agriculture. By this time the results of early strategy of developing agriculture had started paying its dividends slowly. As dynamics of the international rice market changed towards the benefit of the rice producers through better prices, the government had to look into alternative strategies in getting its rice requirement to continue with the RSS. One of the peculiar actions was to reduce the demand for rice through reducing the quantum of rations. The other was to promote domestic rice production and improve marketing and procurement system to benefit the domestic system. In mid 1960s subsidiary food crops were also included under GPS and importation of potatoes, onions and chilies were banned.

The national yield increased to 1.6 Mt/ha and the mean size of operational paddy lands increased to 0.8 ha while the land below 0.4 ha in size decreased to 40 percent. These suggests more marketable surplus available with farmers and the need for appropriate marketing channels for procurement and distribution of domestically produced rice. The government responded this need by introducing the Domestic Produce Purchasing and Storage Act of 1961.

The purpose of this act was to expedite the promotion of co-operative societies' role in involvement in marketing. Consumer cooperative societies and producer co-operative societies were reorganized into multi-purpose cooperative societies (MPSCs) during the 1960s with the objective of increasing the operational efficiency through vertical integration. The government through the newly established People's Bank offered loans to facilitate activities of the MPCS. Financing of new rice/paddy stores and paddy mills were supported through long term credit facilities. However, involvement in the domestic private sector in procurement and marketing was not restricted. There were

many small scale enterprises involved in paddy procurement and processing as well as marketing of rice.

The decade of 1960s marked the emergence of several state enterprises to promote non-paddy agricultural activities in the country. The establishment of the National Milk Board (NMB) to promote the domestic milk industry is a notable milestone. The NMB was responsible in running a network of island-wide milk collecting and processing centers, a spray dried milk powder factory and plants to process milk into several products as yoghurt and ice cream. NMB's kiosks in urban areas to promote milk products became famous for its red and white colored strips. Multinational milk producers had to cease their distribution with introduction of foreign exchange restrictions and MILCO became the only producer of milk powder in the country. It also marked the beginning of the operations of Ceylon Fisheries Corporation and Fishery Harbor Corporation to promote fisheries activities. Promotion of storage of and marketing of fish in inland areas through cold stores and sales outlets were also initiated with the objective of increasing access to sea fish in all parts of the country.

Establishment of Paddy Marketing Board in 1971 and the resultant ending of open market operations in the paddy/rice market marked the dawn of a new era.

Success of the GPS

Farmers' participation in the GPS was voluntary at the beginning and it was as low as 5% during 1948-54. (Gunawardena and Quilkey, 1987). This has increased until 1966 and then began to decline gradually. It should be noted here that farmers themselves are eligible to obtain rationed rice. Thus if a farmer decides to forego consumption of rationed rice he has to use his own rice and forego sale of his paddy at the GPS price. An analysis based on the GPS price of paddy, the quantity and price of rationed rice using data from Gunawardena and Quilkey (1987) is used to explain the various degree of farmer participation in the GPS scheme presented in table 3.

Edirisinghe and Poleman (1977) observed that the apparent per-capita annual consumption of rice remained at 97 kg during 1950 and 1971. It can be argued that farmers had to bear more costs if they decided to forego the rationed rice during 1959 than in 1954. Also the marketing network would have developed in 1959 than its status in 1954. Although the reported open market price of paddy is below the price under the GPS farmers either had constraints in reaching the designated purchasing points or their produce does not meet the required quality standards of the GPS purchases. Marketable surplus also increased as yield increases although the small holdings nature of paddy continued.

Once the government reduced the ration quantity from two measures to one measure in 1966, the demand for rice from the open market increased. The government was the sole importer of rice and the principal reason for reducing the ration was to save foreign exchange and it naturally led to the reduction of imported rice. This prompted consumers to meet a part of their demand through the open market. Thus more demand for open market rice is evident as rice is an essential food commodity. If the GPS price is below the open market price of paddy, it was more rational to a farmer to sell his produce in the open market. As a result government purchases as a percentage of total rice production reduced substantially. Another argument presented to explain the reduction of his is that as rationed rice per family is reduced, farmers substitute that with own rice.

3.2.4 Procurement in a Monopolistic Era

Paddy Marketing Board (PMB) was established by Paddy Marketing Board Act No 14 of 1971 and its operations began in the first quarter of 1972 by purchasing paddy for the 1971/72 Maha season. The PMB was vested with monopoly powers in procurement and sale of paddy. MPCSs were designated to function as sub-agents of PMB in procurement. Rice was milled through private sector mills and rice was handed over to the Food Commissioner for distribution through the MPCSs. The government's objective in establishing the PMB was to purchase more paddy through domestic channels. However, it was disappointing to observe, despite the monopoly powers vested

with the PMB the decline of the percentage of paddy purchased under the GPS scheme. (Table 4).

Table 3—Farmers' Opportunity Costs of not accepting Rationed Rice

Year	Annual Rice Ration (kg)			Excess Need Annual Consumption minus Ration (kg) [a]	Annual Cost of		
					Paid Ration	Opportunity Cost of not Selling Paddy to meet	
	Free	Paid	Total			Paid Ration [b]	Excess Need [b]
1954	0	95	95	0	57.20	83.85	-
1959	0	95	95	0	26.00	83.85	-
1966	47	0	47	48	0.00	0.00	42.33
1971	47	47	95	0	52.00	48.91	-
1973	47	47	95	0	72.80	62.89	-
1975	24	47	71	24	104.00	115.30	58.76
1976	24	24	47	48	52.00	57.65	116.41
1977	24	71	95	0	156.00	172.95	-

[a] Annual per-capita consumption is assumed as 95 kg.
[b] Valued at GPS price of paddy.

Table 4—Purchase under GPS (1965-74)

Year	Total Production (Million Bushels)	GPS Purchases (Million Bushels)	GPS Purchases as a % of Total Production	Remarks
1965	36.2	21.4	58.95	
1966	45.7	28.0	61.26	Reduction of Ration quantity
1967	54.9	13.4	24.40	
1968	64.6	15.1	23.37	
1969	65.9	13.9	21.09	
1970	77.4	26.5	34.23	
1971	66.9	32.3	48.28	Establishment of PMB
1972	62.7	26.3	41.90	
1973	62.9	22.9	36.40	
1974	76.8	20.9	27.21	

Source: Yoshimura *et al*., 1975.

This decline is partly explained by the price differentials presented in table 3. It was rational for farmers to substitute the paid ration with own rice and receive only the free portion of the rice ration. Thus the government failed to procure enough amounts of rice and thus compelled to adopt measures in order to increase the quantity of procurement.

These measures include prohibiting of storage and transportation of paddy in bulk. Farmers were allowed to store in his premises a quantity equal to his own produce. The government also increased the GPS price to Rs. 30.00 per bushel in January, 1974 and to Rs. 33.00 per bushel in July 1974. None of these measures proved effective in persuading farmers to sell paddy to the government. It was learnt that the private sector participated in rice trading and consumers paid high prices for rice if they were to purchase rice other than the ration.

The government simultaneously carried out a campaign to promote the domestic food production. A promotional campaign to substitute rice with other domestically available food stuffs was also in operation. Rice meals offered in institutions and public eating houses were restricted to only five days a week. They were required to offer non-rice meals on Tuesdays and Fridays. Further aggravation of the crisis led to revise the ration quantum in 1973. A further revision of the quantum of free rice entitlement was effective from 1975. The demand for open market rice increased and the private sector was allowed to operate in the market.

During the period, purchasing other field crops through PMB was continued. The government played a key role in price setting of vegetables through public broadcasting of minimum prices for vegetables and eggs and also the marketing department operated purchasing centers in major producing areas. Food remained in the mainstream of the agenda of political parties contested for the general election. Although the ruling party had no major promises, United National Party, the major opposition, had a political pledge to provide eight pounds of grains as a political promise.

The UNP came into power in the election and a universal system to offer four lbs of rice and a similar quantity of wheat flour were offered to each individual. This offer continued through a short period as the rationing system was subjected to a drastic change in the following year. A relatively high producer price and the low consumer price caused a heavy financial burden on the government. By 1978, the expenditure on food subsidies was approximately 20 percent of total government expenditure. The revision was aimed at more targeted welfare program. Rationed rice was limited to households with a monthly income of equal to or less than Rs. 300.00. The RSS was completely replaced by a Food Stamp Scheme in 1978. Although, there was no price discrimination to FSS beneficiaries rice continued to account for around 75% of the value of purchases under the under FSS. The beginning of the FSS also marked the end of an era with high government involvement in the food procurement and distribution system.

Change of the government policy on food rationing greatly reduced the need for the government to procure rice to meet its distribution needs. Although the PMB continued its operations, it no more had to play its original functions.

3.2.5 Government Policies after 1977

The changes of the government policy towards economic liberalization included promotion of private sector. The policy regime after 1977 is a one promoting liberalization. This regime promoted reducing protection and subsidies, reducing tariff and relaxation of quota restrictions. Multiple exchange rate system practiced before 1977 was converted to a unified system. Many State Owned Enterprises were subjected to liquidation or conversion into public companies. Initially, the state retained the majority shareholding due to management interests. Public were allowed to purchase shares of new enterprises through public share offers. These controlling stakes were later sold to private sector through competitive bidding. We discuss in this section the changes made to enterprises with an importance to agricultural marketing and distribution.

Marketing Department

The government decided to discontinue the facilitative and distribution functions of the Marketing Department. The department's fruit processing facility was converted into a government owned company (Lanka Canneries Limited). This was expected to continue fruit processing under the popular MD brand. The facility maintained strong backward linkages with domestic farmers through MD's collection centers in major growing areas. Under the privatization of state owned enterprises, a 60% stake of the shares of the company was offered to the private sector through all or non basis and 30 percent on public share issue. The successful bidder from the domestic private sector paid Rs. 102.5 Million to undertake the management. This change in hands of management led to discontinue backward linkages with domestic farmers as the new management considered it more advantageous to import the raw material for processing. As indicated by Kelegama (1997), the new management of Lanka Canneries imported tomato pulp and puree from India by discontinuing the practices of the old management of the company and its predecessor, the Marketing Department. The government policy of not running the state owned enterprises led to relinquish bakery and the kitchen division of the marketing department which was responsible for supply of food to institutional sector such as the hospitals and the prison etc.

Prima Ceylon and Wheat Flour Distribution

Another important landmark was the arrangement between the government and Prima Ceylon Limited, a subsidiary of a Singapore based company to mill wheat grain. The company made the capital investment for the milling and storage complex in Trincomalee, one of the three major ports in the country. The agreement was initially on Build Operate and Transfer (BOT) basis and was expected to expire in year 1999. According to the agreement, the government would continue to be the sole importer of wheat grain and the company agreed to provide back to the Food Commissioner, a quantity of flour equivalent to 74 percent of the imported wheat grain and to retain the

rest of the produce and by- products as a fee to its services. CWE distributed flour through MPCSs on behalf of the Food Commissioner.

The agreement was revised in 2001 into Build Operate and Own (BOO) basis, thus the company continued to operate the flour mill. The flour and wheat imports were liberalized and wheat flour is imported by other private sector companies today. Prima Ceylon limited began to diversify its operations into feed manufacturing and later into bakery products and into running a chain of retail stores. Since the liberalization of flour distribution Prima Mills distributes floor through a network of agents of which many participants are MPCSs. Prima also began branding its flour differentiated by the prospective end product.

Wheat flour availability in the market has substantial implications on rice demand in the country. Sri Lankan government gets a part of its wheat requirement through PL 480 agreement with the US government. According to the existing arrangements CWE has to pay to the government for PL 480 shipments. CWE was able to generate a profit through its flour trading till 1993. A wheat flour subsidy was introduced in 1994 so wheat price in the market is below the cost. This is an untargeted subsidy and wheat used for other purposes such as producing cakes and biscuits and premium bread which is usually consumed by up-market consumers all get the subsidy.

National Milk Board and Re-Entry of Nestle

In the early years of liberalization once the milk powder imports were liberalized, the government through public share offer and its equity capital formed Lanka Milk Foods (CWE) to handle importation and packaging of milk powder. 51 per cent controlling stake of the company was later sold to the private sector. NMB was converted to a company called MILCO and its distribution system was handed over to individual operators. Nestle entered back the country through Nestle (Lanka) and began operations through out-growers and processing of dried milk powder. Nestle also purchased the condensed milk factory operated by NMB.

Liberalizing the Rice Sector

Rice and other major food items were imported by the Food Department upon advise from the Ministry of Agriculture who decided the import requirement based on production forecasts of the year. The imported rice was distributed through CWE, MPCS and private wholesalers. The role played by the government through the Food Commissioner and the CWE as the sole importer of rice also changed when the private sector companies were allowed to import rice since 1988. This was based on licensing and a strict quota system through bondsmen. The quota was decided according to the deficit of the domestic demand after considering the domestic production and food security concerns of the country. Rice importation was initially offered to three off-shore companies (Rassas and Fitch, 1991). These companies were allowed to import rice and store in the Food Department warehouses leased at commercial rates. Stocks were released to the market according to the requirement of the country and the duty was charged at the point of selling rice to the local market. Bondsmen were allowed to re-export rice without paying duty. There were 10 registered companies under the system by 1995 and only eight of these were active in the trade (Shilpi, 1995). According to the authors bondsmen had little incentives to operate at the tariff and the conditions of operation in effect in 1995. By 1995, the government decided to liberalize rice imports. Licensing system was abolished and the tariff rate of 35% was in effect. The rate was then revised to 20% in 1995. Rice imports were brought under a licensing scheme again on 30th August 1996.

After 1995 this rate of tariff remained unchanged in principle but waivers were granted at different rates in specified periods to curtail increasing prices in the domestic market due to production shortages in the market. However, these duty waivers were not administered by the government vigilantly so sudden increases of imports during short duty waiver periods were well evident. One such incidence is the reduction of tariff during the 4th quarter of 1999. It is observed that 2/3 of the total quantity of rice imported during the year was under the duty reduction facility. The resultant decrease in prices of imported rice resulted in non-purchase of paddy by local millers causing difficulties to

millers and producers. Subsequently, the government intervened through CWE to purchase paddy (Central Bank of Sri Lanka, 2001)

Domestic Procurement Sector in the era of Liberalization

In the domestic procurement, the government policy was not anyway promoting the PMB but its presence had been useful at a few instances. The UNP government in 1977 increased the GP of paddy to Rs. 40.00 per bushel. The resultant supply increased procurement during the August harvest. This momentum was continued in the following year making the PMB to purchase 36% of the production. Since then PMB purchases began to decline. PMB purchases accounted on average for less than five percent of the total production in normal years for the period 1980-90. Exceptions are observed in 1983, 1989 and 1990. These three years are important as year 1983 is the year of the referendum held to extend the tenure of the government in power while the latter two years, the civil disturbances in principal rice growing districts may have virtually stopped the operations of PMB. Annual average of PMB purchases were only 1.3 percent for the period 1991-93. Around 1991, the government began to hand over PMB facilities situated in different parts of the country to other activities so it was lacking essential infrastructure to up scale its operations.

During 1994, the year of the general election and the year in which farmers complained about prolonged low prices of paddy, the party in power was defeated in the general election. With the directives of the new government PMB intensified its purchases recording its purchases as 5% of the total production. Much of these purchases were for the yala crop of which the harvesting season came soon after the election. In the following year PMB purchases increased to 10 percent of the total production. It is argued that subsequent sale of this procured paddy brought heavy financial losses. PMB operations were terminated in 1996. During the period of inactivity/non existence of the PMB, the government had to intervene frequently in the procurement of paddy through its apparatus such as the CWE, Co-Ops and through release of finances to farmer organizations through government agents.

4. AOA OF WTO: IMPACTS ON THE PADDY/RICE SECTOR IN SRI LANKA

4.1 INTRODUCTION

An assessment of the impacts of the Agreement on Agriculture (AoA) of the World Trade Organization (WTO) is of primary importance for a net food importing country like Sri Lanka in formulating policies to mitigate adverse impacts, if any, and as preparation for negotiations at the upcoming trade rounds. The objective of this chapter is to analyze the commitments with AoA and to assess the likely impact of AoA on the Sri Lankan economy in terms of production, trade and prices of food crops and food security.

The chapter is organized as follows. First, it provides an overview of AoA. Second, it presents the commitments made by Sri Lanka. The next section shows the possible impacts on the Sri Lankan economy, with a special emphasis on imports and food security. The chapter ends with a summary and conclusion of the findings.

4.1.1 World Trade Organization

Since 1948, the General Agreement on Tariff and Trade (GATT) had provided the general rules and regulations for the global trading system. Over the years, GATT evolved through several rounds of negotiations (Table 5). The latest and largest round was the Uruguay round which lasted from 1986 to 1994 and led to the creation of the World Trade Organization (WTO). Whereas GATT had mainly dealt with trade in goods, WTO and its agreements now cover trade in services, and traded inventions, creations and designs (intellectual property).

At present, WTO is the only international body dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations. These documents provide the legal ground-rules for international commerce. They are essentially contracts, binding governments to keep their trade policies within agreed limits. Although negotiated and signed by

governments, the ultimate goal is to help producers of goods and services, exporters and importers conduct their business.

Table 5—The GATT Trade Rounds

Year	Place/Name	Subjects Covered	Number of Participating Countries
1947	Geneva	Tariffs	23
1949	Annecy	Tariffs	13
1951	Torquay	Tariffs	38
1956	Geneva	Tariffs	26
1960-1961	Geneva (Dillan Round)	Tariffs	26
1964-1967	Geneva (Kennedy Round)	Tariffs and anti-dumping measures	62
1973-1979	Geneva (Tokyo Round)	Tariffs, non-tariff measures, "framework" agreements	102
1986-1994	Geneva (Uruguay Round)	Tariffs, non-tariff measures, rules, services, intellectual property, dispute settlement, textiles, agriculture, creation of WTO etc.	123

4.1.2 AoA and Uruguay Round

The original GATT applied to agricultural trade, but it contained loopholes. For example, it allowed countries to use some non-tariff measures such as import quotas, and also to use subsidies. As a result, agricultural trade became highly distorted, especially with the use of export subsidies which would normally not have been allowed for industrial products. The Uruguay round agreement is a significant first step towards order, fair competition and a less distorted agricultural sector.

The objective of the AoA is to reform trade in the sector and to make policies more market-oriented. The new rules and commitments apply to market access, domestic support and export subsidies.

Market Access (Article 4)

The new rule for market access in agricultural products is tariffs only. All the non-tariff barriers have been replaced by tariffs that provide more-or-less equivalent

levels of protection. The process of converting non-tariff barriers into tariff is called tariffication.

The package ensures that quantities imported before the agreement took effect could continue to be imported, and it guarantees that some new quantities are charged duty rates that are not prohibitive. This is achieved by a system of "tariff-quotas"—lower tariff rates for specified quantities that exceed the quota.

The newly committed tariffs and tariff quotas, covering all agricultural products took effect in 1995. Developed countries would cut the tariff by an average of 36% in equal steps over six years. Developing countries would make 24% cuts over 10 years. They have the option of offering ceiling tariff rates in cases where duties were not bound. Least developed countries do not have to cut their tariffs at all.

In addition, for products whose non-tariff restrictions have been converted to tariffs, governments are allowed to take special emergency actions (safeguards) in order to prevent swiftly falling prices or surges in imports from hurting domestic farmers.

Domestic Support (Article 6)

AoA attempts to reduce subsidies and other programs, including those that raise or guarantee farm-gate prices and farmers' incomes. The AoA distinguishes between support programs that stimulate production directly, and those that are considered to have no direct effect. The direct support provided is measured using Total Aggregate Measurement Support (AMS) for the agricultural sector per year in the base year of 1986-1988.

Developed countries would reduce AMS by 20% over six years. Developing countries would make 13% cuts over 10 years. Least developed countries do not have to cut their support.

Measures with minimum impact on trade, which are in the "green box" can be used freely. They include government services such as research, disease control, infra-

structure, food security, direct income transfers to farmers, assistance to help farmers restructure agriculture, and direct payments under environmental and regional assistance programs. Also permitted are direct payments to farmers to limit production, government assistance programs to encourage agricultural and rural development in developing countries, and small scale support (5% or less in developed countries and 10% or less for developing countries from the total value of the product).

Export Subsidies (Article 9)

AoA attempts to cut down export subsidies which are used to make exports artificially competitive. Taking averages for 1986-1990 as the base level, developed countries have agreed to cut the value of export subsidies by 36% over six years starting in 1995 and developing countries have agreed for 24% over 10 years. Developed countries have also agreed to cut the quantities of subsidized exports by 21% over six years starting in 1995 and developing countries have agreed for 14% over 10 years. Least developed countries do not need to make any cuts.

During the 6-year implementation period, developed countries are allowed, under certain conditions, to use subsidies to reduce the cost of marketing and transporting exports.

Table 6—Numerical Targets for Cutting Subsidies and Protection Agreed in the Uruguay Round

	Developed countries 6 years: 1995-2000	**Developing countries 10 years: 1995-2004.**
Tariff		
Average cut for all agricultural products	-36%	-24%
Minimum cut per products	-15%	-10%
Domestic support		
Total AMS cut (base period 1986-88)	-20%	-13%
Exports		
Value of subsidies	-36%	-24%
Subsidized quantities (base period: 1986-90)	-21%	-14%

Note: The base level of the tariff cut was the bound rate before 1 January 1995; or, for unbounded tariffs, the actual rate charged in September 1986 when the Uruguay round began.

4.1.3 AoA and Special and Differential Treatment

It can be predicted that, based on the above discussion, that the impact of the AoA is more significant for consumers and consumption policies in net food-importing countries. To alleviate the burden on the food import bill and balance of payments and to enhance the capacity of developing countries in increasing their agricultural production capacity in order to reduce the high dependence on imports, the following special measures on food security were included in the AoA. These concerns were formulated first, in Article 20 of AoA negotiated during the Uruguay round, and were reaffirmed in the Doha declaration, confirming that special and differential treatment will be granted to developed countries, "to effectively take account of their development needs, including food security and rural development" (Healy *et al.,*. 1998):

(a) Augmenting the provision of food aid by reviewing the level of food aid and providing increasing amounts under grant terms.
(b) Promises for full consideration of requests for financial and technical assistance to improve agricultural productivity and infrastructure.
(c) "Appropriate provision" for differential terms with respect to export credits.
(d) Short-term assistance in financing normal imports from international financial institutions under existing facilities, or those established in the context of adjustment programs.

Several developing countries have presented their concerns about food security issues, including the possibility of special and differential treatment embedded in a "Development Box" or a "Food Security Box."

According to the AOA's requirement for the continuation of agricultural trade reform process, negotiations began in 2000. After the Ministerial conference in Doha in November 2001, talks on agriculture are scheduled to end by 1 January 2005. Based on the proposals submitted by members, the chairman of the agriculture committee of the WTO prepared the draft modalities for the negotiations.

4.2 COMMITMENTS MADE BY SRI LANKA

Although AoA lays out the basic rules and definitions regarding policy making, it does not include within it, specific quantitative commitments on a country-by-country and commodity-by-commodity basis. Such quantitative commitments are stipulated in the country schedules, that each signatory to the agreement has been required to submit. The country schedules comprise a statement by each member government, on a commodity-by-commodity basis, of their position on each of the issues concerned (tariff and non-tariff barriers, domestic support and export subsidies) prior to the implementation of the provisions by the agreement, together with an outline of how the provisions will be achieved. The following section describes the position of Sri Lanka regarding the commitments.

4.2.1 Position of the Trade Policies

The agricultural sector in Sri Lanka was substantially liberalised prior to the adoption of the AoA due to economic reforms programs led by the World Bank and the IMF. In fact, the agricultural sector in Sri Lanka was more liberalised than what was required under Sri Lanka's AoA commitments at the Uruguay Round negotiations in 1994. Therefore, it was not necessary to reduce any of the assistance or protection provided to the agriculture sector.

Tariffs

Sri Lanka has bound around 99% of the tariff lines of the agricultural products at 50% and the remaining 1% of the tariff lines are 175%, 60%, 45%, 40%, 20%, 10% and 5% ad-velorum and 60% non-ad-velorum. However, at present, applied tariff rates of many items are as low as 25%, 10% and 2% except for a very few items. Specific duties have been introduced to some sensitive products such as potatoes, big onions, red onions, cowpea and green gram recently to protect domestic farmers. At present specific duty is imposed on importation of rice of Rs. 5-6 per kg. In the past it has been revised upwards

during peak harvesting periods and downwards during lean periods, to protect large community of rice farmers.

Sri Lanka identified about 75% to 50% of tariff lines which are covered under AoA as 'import-sensitive' tariff lines and within that category some products, as 'special products' based on whether they affect food security, rural development and or livelihood security concerns. No tariff reduction commitments are applied for those products in their schedules of commitments. Rate of reduction (tariff cut) for import-sensitive items are lower than those for the balance items. Base rate for reduction is the bound rate for all products and tariff cut will be in equal annual installments over 10 years and the year of commencement would be the year one of the implementation period.

Import Licenses

At present Sri Lanka does not have license control for agriculture items other than for plant quarantine purposes. However, in some instances in the past, (July 2000) licensing was imposed temporarily to control falling domestic paddy prices due to the bumper paddy harvests. Later this licensing requirement was replaced by a specific duty. Even though AoA requires all non-tariff barriers to be converted into tariff barriers and import licensing schemes could also be actionable policies, such market access provisions do not apply when the commodity in question is a traditional staple of a developing country. As a result, in Sri Lanka, the import licensing scheme on rice can be exempted.

4.2.2 Position of Domestic Agricultural Policies

AoA urges countries to quantify all domestic support, i.e., creation of AMS. Most of the domestic agricultural policies implemented by Sri Lanka either fall into the green box or the blue box and are therefore exempted from AMS calculation. Sri Lanka did not report outlays on "trade-distorting" support measures as captured by AMS, and thus committed itself to limiting support to 10% of the value of production under the De Minimis rule. It also did not report outlays on development measures, but has the right to claim this exemption for such measures in the future, if necessary (FAO, 2000).

The De Minimis provision allows a country to be exempt from reduction commitments and the exception is given when the support does not exceed 10% of the value of production of a basic product (in the case of product-specific support), or of the value of total agricultural production (in the case of non-product specific domestic support). The incentives which do not fall under the green or blue box category fall into this category. Furthermore, subsidies to poor farmers are exempted, and if the subsidy helps in improving land management, it will be exempted.

As a result, Sri Lanka does not have to cut down on any existing production subsidies. The following section explains the position for each policy.

Fertilizer Subsidy

Sri Lanka introduced a fertilizer subsidy scheme in 1994 and in October 1997 it was confined to urea only. This subsidy fixed the price of urea in the domestic market and the difference between the imported price and the domestic price was given by the government to the importer as a subsidy. However, due to commitments with donor agencies like the World Bank and the limitation of budgetary allocations, this subsidy scheme was changed to a fixed subsidy rate allowing the market to determine the price according to world market prices. As subsidies to poor farmers are exempted, Sri Lanka does not need to eliminate the fertilizer subsidy due to commitments with AoA.

Water Subsidy

Development of large irrigation schemes is one of the major policy instruments used by successive Sri Lankan governments to achieve food self-sufficiency. At present, the government handles the maintenance and operation of these facilities. Because such expenditure falls under "land improvement" it is exempted from AoA commitments. However, the recent water policy document involves transferring management of water resources to farmer organizations; and as a result, subsidy on maintenance and management will be eliminated despite this exemption.

Guaranteed Price Scheme

Sri Lanka had guaranteed price schemes for paddy until 1996, but the purchases under that scheme were very small. At present there is no guaranteed price for paddy or any other crop. However, governments regularly announce recommended price levels for the purchase of paddy and some government agencies, such as cooperatives, purchase paddy at the recommended rate. However, such purchases are on a very small scale and always less than even 5% of the domestic production. Deficiency payments categorized under Blue Box subsidies recognized as a useful tool to bridge the gap between low market prices and recommended minimum prices, especially in rice.

Concessionary Credit

State and domestic commercial banks provide cultivation loans at concessionary rates under the New Comprehensive Rural Credit Scheme operated by the government. Generally 65% to 75% of the total allocated credit is granted to paddy farmers. However institutional credit to paddy farmers is only about 2%- 3% of the total credit requirement for paddy cultivation and the total credit requirement is largely met by informal sources. Even though subsidies to poor farmers are exempted from AoA commitments, Sri Lanka does not use these provisions to the benefit of majority of poor farmers due to budget constraints.

Sri Lanka will maintain the provisions under article 6.2 dealing with special and differential subsidies, enhance the provision given by the chairman of WTO, such as subsidies for concessional loans through established credit institutions or the establishment of regional and community credit cooperatives, transportation subsidies for agricultural products and farm inputs to remote areas, government assistance for the establishment and operation of agricultural cooperatives, government assistance for risk management of agricultural producers and savings instruments to reduce year-to-year variations in farm incomes which are excluded when calculating the AMS.

Research and Extension

Like other developing and developed countries, Sri Lanka has been investing in agricultural research and extension services. AoA considers these as green box policies and are therefore exempted[2]. However, governments are encouraged by AoA to promote demand-driven research in agriculture to enable private sector participation in research and extension services.

Plant Quarantine Service

This confirms to green box criteria. These services are provided free of charge in order to restrict imports of noxious plants and animals that may infect and affect the domestic flora and fauna.

Seed Certification Service

This also confirms to green box criteria. These services are provided, for a modest f0ee, to farmers who produce seeds and planting materials and are aimed at ensuring the quality of the material produced.

Crop Development Fund

Through cess raised on export crops, development activities are supported in tea, rubber and coconut smallholdings and research activities on other plantation crops. As the government does not make any contribution to the cess fund, these programs are exempt from reduction commitments.

Some of the agricultural policies implemented by Sri Lankan governments will be down-scaled and in future be completely eliminated, mainly due to commitments with

[2] Under Green Box measures (permissible provisions of Annex 2 of AoA), important measures for Sri Lanka under the National Policy on Agriculture and Livestock 2003-2010 include provisions such as: general services (research, extension, advisory, training, marketing promotion, infrastructure services, etc.); public stockholdings for food security purposes; domestic food aid; direct payment; payment for relief from natural disasters; payment under regional assistance programs.

donor agencies, even though such policies can be maintained under commitments with AoA.

4.2.3 Position of Export Subsidies

Sri Lanka did not have any subsidy programs other than subsidies to reduce the cost of marketing of agricultural product exports (air freight subsidy to fruit and vegetable products) as identified under the export subsidy commitment (article 9.1 (d), (e)). However, due to lack of funds, these programs were not continued. Sri Lanka did not have export subsidies in the base period 1986-1988 and hence did not declare any export subsidies in its schedule.

The export incentives provided by the Sri Lanka Export Development Board (SLEDB) and BOI are exempted. Some examples are:

(i) Transport and marketing subsidies on exports of developing countries are exempt from the AoA commitment. Export subsidy on cut flowers is exempted as it is a freight subsidy.

(ii) The SLEDB assists new exporters in non-traditional agricultural activities with grants of up to 3% of the FOB value during the first year of operation. They are also eligible in principle to use the refinancing facilities operated by the Central Bank and seed capital for new ventures provided by the SLEDB, as well as income tax exemption and customs duty waiver on intermediate goods imports under the Board of Investment (BOI). With the exception of a few large companies involved in the sea-food industry and horticulture. All subsidies on non-plantation export crops amount to less than 1 per cent of export earnings from the designated products (Athukorale and Kalegama, 1996) are hence exempted.

(iii) Export subsidies given to the tea exports sector by the Tea Board which include a 50% in interest rate subsidy on loans obtained for the purchase of machinery for manufacture of tea bags (Athukorala and Kelegama, 1996) are

also exempted. In 1992, the total value of these subsidies (Rs 26 million) amounted to less than 0.5% of the total value of processed tea exports.

(iv) Subsidies given by the SLEDB to exporters of fresh fruits and vegetables on imported packing materials (Athukorala and Kalegama, 1996) are exempted.

4.2.4 Special and Differential Treatment

Sri Lanka supports the draft ministerial declaration that developing countries should continue to enjoy benefits from special and differential treatment provisions. It also supports the concerns of net food-importing countries in the draft ministerial declaration.

Proposals submitted by Sri Lanka along with other developing countries for the creation of a 'development box' focus on measures that would enhance food security and safeguard the livelihoods of rural communities.

- The main element of the proposal was to protect staple food crops, which provide the main livelihood for low income and resource-poor farmers. These should be exempted from the further reductions due to commitments under AoA.

- The proposal suggested that as a special and differential measure, developing countries at or below the de minimus level of allowed domestic support, should be allowed to maintain an 'appropriate' tariff binding on their food-security crops. It means allowing an increase in bound rates if current bindings do not provide effective protection for such food-security crops.

- It also suggested that article 6.2 of AoA should be expanded to include an array of measures of assistance geared towards addressing food security, and for preserving the viability of rural employment.

4.3 IMPLICATIONS FOR THE PADDY/RICE SECTOR IN SRI LANKA

AoA was not expected to result in significant changes in world production of rice but the volume of trade was expected to rise by 5%, largely because of the market access commitments by Japan and the Republic of Korea (FAO, 1999). Hence, the impact of AoA commitments on rice markets in Sri Lanka mainly depends on the commitments made by Sri Lanka. As shown earlier, Sri Lanka has already eliminated the import-licensing scheme, and the only commitment will be to reduce tariff. The current policy is to regulate rice imports by changing specific duty upwards and downwards within the bound rate during peak harvesting periods and lean periods. It is expected that rice will be included as a special product under the import-sensitive category. For such products tariff reductions are not applicable or minimal. Domestic support and export subsidy commitments are based on the base levels of such support during the 1986-1988 period and Sri Lanka did not have any trade distorting programs during this period.

5. GOVERNMENT–PRIVATE INTERFACE IN PADDY MARKETING IN SRI LANKA

5.1 INTRODUCTION

Since independence, successive Sri Lankan governments have provided constant support to the rice/paddy sector, to ensure adequate income for farmers, to provide rice at a low price to urban consumers, and to stabilize rice and paddy prices. As a result of these interventions, Sri Lanka has achieved near self-sufficiency in rice. However, some of the original objectives of these policies have not been fully achieved—many farmers do not earn an adequate income from paddy, Sri Lankan consumers pay higher prices for rice compared to world market prices, and the stability of local paddy and rice prices are not very different from those of the world market.

This chapter focuses on the impacts of government interventions in the rice sector in Sri Lanka with a special emphasis on the rice/paddy marketing activities carried out by

the government and private sectors. The specific objectives are (i) to investigate the impact of rice-trade liberalization on prices, supply and demand of rice and paddy, rice imports and calorie intake, and (ii) to investigate the impact of the government paddy procurement program on supply, demand and prices.

Based on the results, which were obtained using an econometrically estimated partial equilibrium model, this study supports rice-trade liberalization because this strategy will decrease rice prices, which is directly beneficial to consumers, as it increases calorie consumption. It is therefore argued that the government should minimize or eliminate import restrictions and encourage private sector importation of rice. However, at the same time, it is also argued that the government should increase its presence in paddy procurement and thereby ensure that the interests of small-scale farmers (belonging to one of the lowest income groups in the country) are protected.

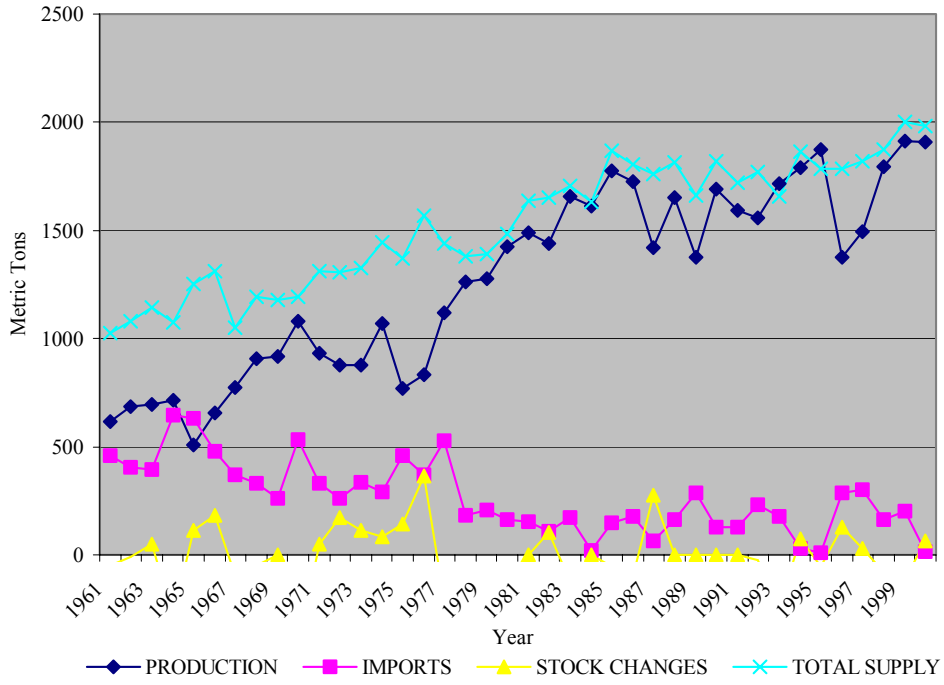
This chapter is organized into seven sections. The introduction sets out the objectives of the study. This is followed by discussions on the status of the rice sector and the development of domestic marketing and trade policies related to the rice sector. The next section explains the conceptual model, followed by a section on the empirical model and data. The next two sections explain the econometric and simulation results. The final section is devoted to conclusions and suggestions for further research.

5.2 RICE/PADDY SECTOR IN SRI LANKA

5.2.1 Economic Significance

The rice sector occupies a key position in the economy of Sri Lanka. During the 1996-2000 periods this sector contributed on the average 22% to the agricultural GDP of the country, while the total contribution from the agricultural sector to the national GDP was 20%. Currently, Sri Lanka is 96% self sufficient in rice, which is the staple food of the country (Figure 6). Though declining, the agricultural sector still absorbs 32.6% of the labor force of the country (Central Bank, 2001). Out of this agricultural labor force, the paddy sector employs about 50%.

Figure 6—Trends in the Rice Sector of Sri Lanka, 1961-2000



Paddy continues to hold its primary position as the crop with the largest cultivated extent among all crops grown in the country. About 850,000 ha of land in all parts of the country is under paddy cultivation. Paddy is the principal contributor to the rural economy in the country because the majority of rural households engage not only in production but also marketing of rice as their main or additional source of livelihood.

5.2.2 Efficiency of Paddy Production

More than 70% of paddy holdings are less than 1 ha and only about 5% of farmers have a holding size of greater than 2 ha. The income earned from paddy is not sufficient to meet basic needs of a family and poverty is prevalent among paddy farmers, especially those who cultivate on a small scale (Ranaweera *et al.,* 1990; Gunawardena, 2000; Weerahewa *et al*., 2003). According to Shilipi (1995), Domestic Resource Costs (DRCs)—a measure of comparative advantage—is 1.73 for the *maha* season (major cultivation season) in 1993 suggesting that there is no comparative advantage in growing

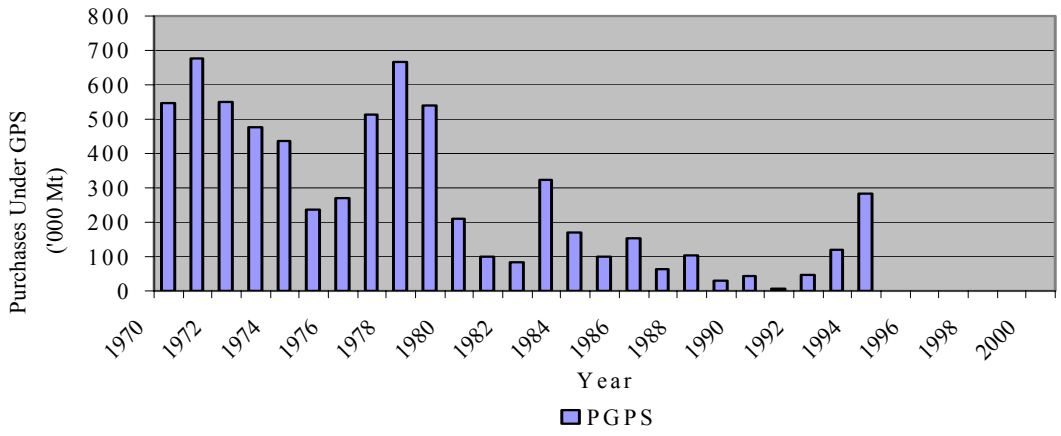
paddy in Sri Lanka. Rafeek and Samarathunage (2000) also indicate that $ 1 of resources is used to produce only 56 cents worth of rice valued in terms of foreign exchange. However, Wijayaratna *et al*. (1996) show that when irrigation and land costs were not taken into account, there is a comparative advantage in growing paddy in 1993. Also, Kikuchi *et al*. (2000 and 2001) state that though comparative advantage in paddy farming has been declining over the years, Sri Lanka still has a comparative advantage in growing paddy under major irrigation schemes. Also, according to Abeyratna *et al*. (1990) there is still a comparative advantage in growing paddy under certain circumstances. According to them the DRC is 0.88 when irrigation costs can be limited to rehabilitation costs for Kalawewa, Polonnaruwa, Hambantota, Anuradhapura, Kurunegala, and Kegalle districts. They also indicate that productivity and border price are the most sensitive variables affecting DRC. Weerahewa *et al.* (2003a) and Thibbotuwawa (2004) showed that there is a comparative advantage in growing paddy only when it is cultivated on large scale.

5.2.3 Rice/Paddy Marketing

The private sector handles nearly 80% of the marketing functions in the rice-trade system in Sri Lanka. The role of the government in paddy purchasing activities has been declining over the years (Figure 7). At the farm level, a number of private entrepreneurs are involved in purchasing paddy. These are the assembly agents, brokers, small operators and rice millers. The assemblers are the primary buyers of paddy and are often referred to as collectors. Some of them are paddy producers, input suppliers, and grocery traders. Many paddy assemblers are located in paddy producing areas and only a very few hold stocks due to lack of storage facilities and finances. These assembly agents distribute the stocks of paddy to millers who are located in different parts of the country. Some of these millers stock paddy and mill it at a later stage. The amount of paddy milled usually depends on the price of rice. The wholesale rice dealers in the Colombo market play a major role within this distribution system. They operate under a commission basis as well as on a direct buying system from millers. They also sell rice to retailers. In addition to the distribution function, wholesalers are also centrally involved in making

advance payments to suppliers, bulk breaking to match the demand, keeping suppliers and distributors informed about the prices, and supplying trading finance (Somaratne, 1987). The Colombo wholesale market handles about 60% of the total rice supply in the country. The importance of the Colombo market has declined significantly in the recent past because millers increasingly supply to wholesalers and retailers directly—bypassing the wholesale market. After rice stocks reach the wholesale market, wholesalers sell rice to retailers in every part of the country.

Figure 7—Changes in the Paddy Procurement Scheme, 1970-2000



5.2.4 Rice/ Paddy Price Stability

Comparisons made among different price series using monthly average producer prices, average retail and wholesale prices of different grades of rice for the period 1991-2001, obtained from HARTI (Hector Kobbakaduwa Agrarian Research and Training Institute) publications show that the stability in rice and paddy prices as explained by the coefficient of variation is approximately 20% (Table 7). Figures 8 and 9, respectively depict long-term trends of nominal price and real price of *samba* rice (par-boiled rice), farm-gate price of short-grain paddy and f.o.b. price of Thai rice.

The stability of rice prices in the world market depends on the country of origin. Rice prices in Bangkok, India, Vietnam and Pakistan (f.o.b.) obtained from the United

States Agency for International Development (USAID) 2002 show that the coefficient of variation is smaller for f.o.b. prices in India when compared with those of Thailand.[3]

Table 7—Measures of Dispersion of Nominal Paddy and Rice Prices

Level	Type	Mean (Rs/kg)	Standard deviation (Rs/kg)	Coefficient of variation (Percentage)
Wholesale	Samba Rice I	23.56	4.75	20.16
Retail	Samba Rice I	26.42	4.91	18.58
Wholesale	Kora Rice I	18.14	3.98	21.94
Retail	Kora Rice I	20.82	4.34	20.84
Wholesale	Nadu Rice I	17.87	4.17	23.31
Retail	Nadu Rice I	20.54	4.56	22.22
Wholesale	Raw red rice	18.82	4.48	23.80
Retail	Raw red rice	21.63	4.95	22.89
Wholesale	Raw white rice	17.01	4.01	23.59
Retail	Raw white rice	19.63	4.45	22.66
Farm gate	Short grain paddy	10.51	1.99	18.92
Farm gate	Long grain paddy	8.94	1.99	22.26
Thailand	5% broken rice	15.04	3.27	21.75
Thailand	15%broken rice	14.06	3.16	22.49
Vietnam	10%broken rice	15.34	2.03	13.22
India	10%broken rice	18.23	1.12	6.17
Pakistan	10%broken rice	15.28	1.56	10.24

[3] Monthly f.o.b. prices in India were available for the period 1977-2000, and hence the coefficient of variation was calculated for all the series for this period too. It was found that coefficient of variation is around 13% for all the series.

Figure 8—Nominal Prices of Samba Rice

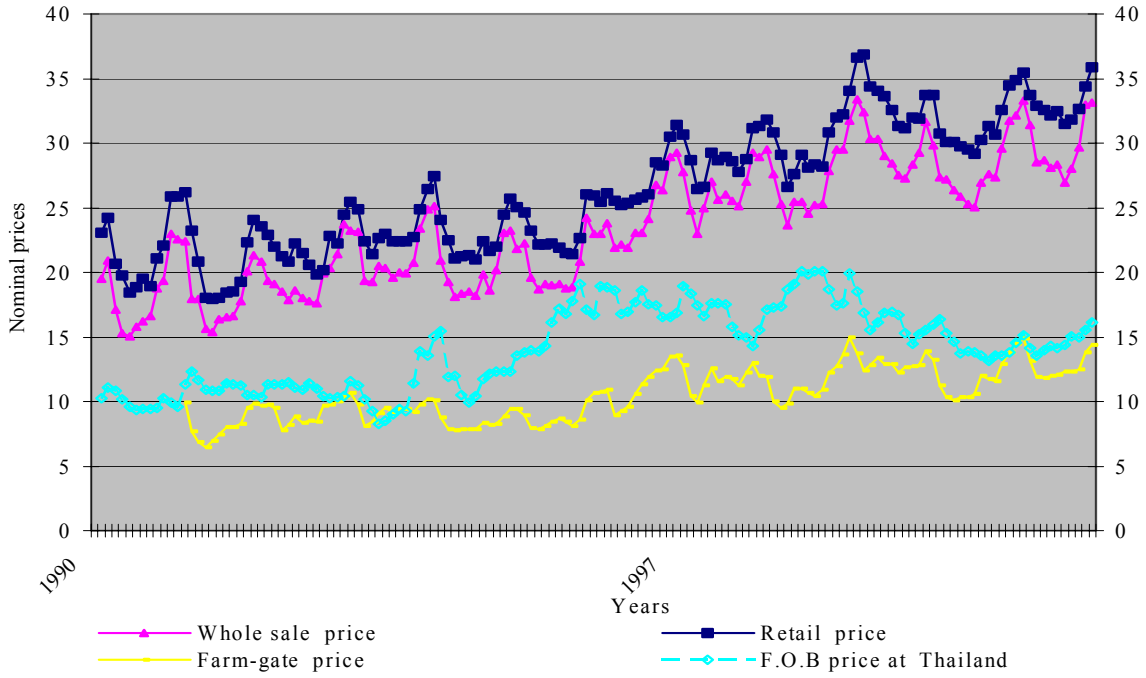
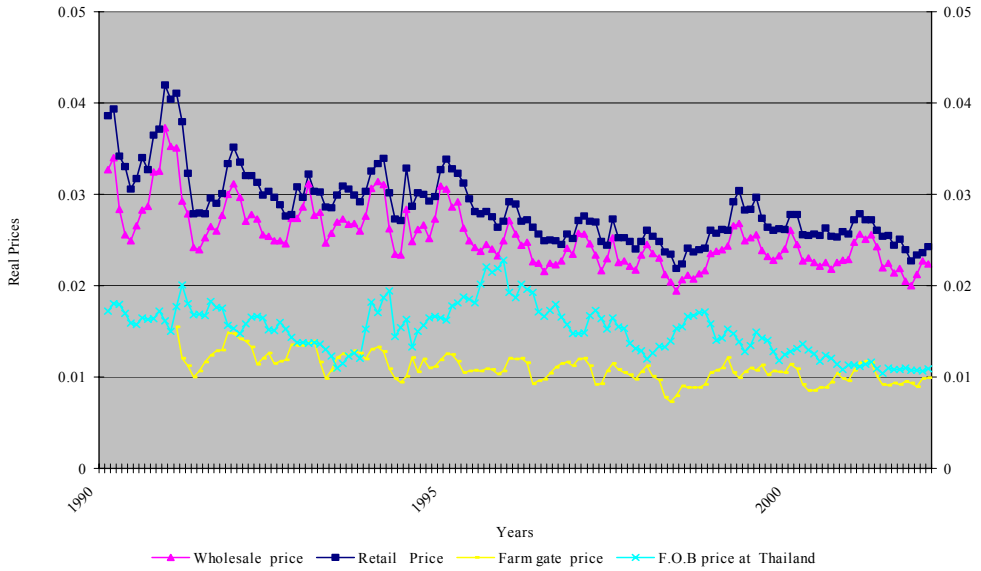


Figure 9—Real Prices of Samba Rice



5.2.5 Rice Consumption

Rice is the staple food in Sri Lanka. The average consumption of rice was 95.15 kg/year/person in 2000 (Food Balance Sheets, 2002). Rice provides the predominant source of calories in Sri Lanka. It is also a major source of protein for the majority of the population. A majority of consumers spend a considerable portion of their income on rice. Findings of the Consumer Finance and Socio-economic Survey, conducted by the Central Bank of Sri Lanka, reveal that the expenditure on rice as a percentage of total food expenditure in 1981/82 and 1996/97 was 28.3% and 20.4%, respectively. For lower income groups the percentage expenditure on rice is even higher. According to the same survey, approximately one fifth of the total population consumed below 1,800 kcal per day. Continuing disparities in nutritional intake among different sectors of the economy; *i.e.*, urban, rural and estate sectors is evident (Table 8). Although there are indications that the nutritional status of the lowest 10% income group improved over the recent past, the nutritional status of middle and low-income groups deteriorated further as they began to spend more on non-food items.

Table 8—Per capita Calorie Consumption in Different Sectors

Survey	All sectors	Urban	Rural	Estate
1969/70	2264	2161	2268	2459
1973	1936	1957	1837	2345
1978/79	2283	2240	2230	2763
1980/81	2271	2001	2210	2122
1981/82	2105	2229	2246	2639
1990/91	-	-	2103	2473

Source: Rathnayake, 1998.

5.2.6 Trade and Marketing Policies in Sri Lanka

Sri Lanka has an extensive experience in pursuing a variety of trade and domestic marketing policies to develop the rice/paddy sector. During the years immediately following independence, governments had relatively few problems in importing food as satisfactory foreign exchange reserves were available. Nevertheless, the political

leadership of the country supported and encouraged investments in major agricultural development as a long-term strategy. As returns from investments in agriculture began to bear results, purchasing food from domestic markets to replace a part of the government's imports became a viable option. Governments also nurtured cooperative societies as a policy because they supported the government intention of distributing rationed/subsidized food. Because cooperative societies had a network that penetrated all parts of the island, they also provided support, at least in principle, to the government's drive to purchase domestically produced food.

The first-ever involvement of the government in purchasing domestically produced food commodities was offered on a voluntary basis from the supplier's side in 1948. The Guaranteed Price Scheme (GPS) introduced in 1948 had the main objective of providing an assured market for rice and twelve other locally produced commodities. Government departments and cooperative societies were involved in implementing the scheme, but private traders were not restricted from operating in the market. The GPS system was strengthened by the *Agricultural Products (Guaranteed Price and Paddy Milling) Act of 1961* with support from cooperative societies in the procurement and storage and processing of rice. Private traders simultaneously operated in the market with a higher share in areas where cooperatives had less activity. The Food Subsidy Scheme was also in operation, though subject to alterations at different times. Thus, the government played the role of a large-scale purchaser of paddy. Increasingly governments began to face severe foreign exchange problems and the need to purchase food from the domestic market became imperative. The demand for government procurement increased and this coincided with a time of high international food prices. In 1971 the Paddy Marketing Board (PMB) was established with monopolistic rice trading powers within the country.

The PMB was solely responsible for paddy procurement with cooperatives acting as its agents in buying paddy from farmers. The private sector was banned from procurement and marketing of paddy. The Food Commissioner's Department continued to play its role as the import and distribution arm of the government. Although private

businessmen were in theory only allowed to carry out milling, studies show that private trading was also operational during this period (Yoshimura *et al.*, 1975).

The universal consumer subsidy of rice was revised in 1970 to exclude income tax payers and in March 1978 the rice rationing system underwent a drastic and unprecedented change (Gunawardena and Quilkey, 1987). This policy change was due to the advent of a new liberal economic policy adopted by the government that came into power in 1977.

With the liberalization of the economy and the abolishing of the rice-rationing scheme, the need for the government to play a purchasing role began to diminish. The country had reached self-sufficiency in rice by this time. Large-scale rice imports were no longer necessary and the procurement and distribution of paddy was largely taken over by the private sector in the mid-eighties. The role of the PMB was reduced to price stabilizing during bad seasons. Although PMB purchases were about 5% countrywide in the 1980s, its contribution in the main rice producing districts was above 65% (Dharmaratne and Hathurusinghe, 1999). The import of paddy earlier handled by the Food Commissioners Department was handed over in 1988 to three offshore companies functioning as bondsmen. Rice importing was brought under a licensing scheme and rice imports were subjected to tariff regulations after 1994. However, in times of crisis in the domestic rice production, the government has given duty waivers to importers and it is evident in many occasions that the ad-hoc waiver of duty lead to a glut of rice in the local market (Table 9).

The PMB was shut down in 1996. However this has not solved the crisis of low purchase prices during harvesting time having an adverse affect on poor farmers. It is evident that the government even during the period of the PMB had to intervene in purchasing paddy through the Cooperative Wholesale Establishment (CWE) or through Farmer Organizations during crisis times. Although the need for state involvement is not ruled out completely, through agreements with donor agencies such as the IMF and the World Bank, Sri Lanka has been continuing to open up its economy and increasingly committed to remove protection schemes for domestic producers. Sri Lanka may have to

continue this trend due to commitments originating from the Pakistan-Sri Lanka free trade agreement (FTA) to be negotiated in the near future.

Table 9—Import Restrictions on Rice

Period	Statutory duty (%)	Duty Waiver	Effective import duty	Surcharge	TT/GST (%)	DL/NSL (%)
Jan1,1995-Feb7,1995	35 or Rs7/kg	0	55	0	Ex	4.5
Feb8,1995-Apr14,1996	35	0	35	0	Ex	4.5
Apr15,1996-Jan30,1997	35	35	0	0	Ex	4.5
Jan31,1997-Nov20,1997	35	0	35	0	Ex	4.5
Nov21,1997-Jan31,1998	35	35	0	0	Ex	4.5
Feb01,1998-Nov05,1998	35	0	35	0	Ex	4.5
Nov06,1998-Oct23,1999	35	0	35	0	Ex	5.5
Oct24,1999-Dec31,1999	35	25	10	0	Ex	5.5
Jan01,2000-May10,2000	35	0	35	0	Ex	5.5
May11,2000-Jul 16,2000	35	0	35	0	Ex	6.5
Jul17,2000*	35	0	35	0	Ex	6.5
Jan2001*	35	0	35	14	Ex	6.5

Source: Epaarachchi *et al.,* 2002.

5.3 CONCEPTUAL MODEL

In this study a conceptual model was developed to capture the changes in the policy framework discussed in the above section. A partial equilibrium model, treating Sri Lanka as a small net importer of rice, was developed. It represents the consumer side by a demand system for cereals (rice, wheat and millet), the producer side by a paddy supply function, and marketing functions by an equation to link paddy prices and rice prices. Government procurement is considered as an exogenous variable affecting marketing functions. A tariff barrier and other border charges link retail price of rice with the world market price of rice. The demand system, paddy supply function and marketing function are considered stochastic and they were econometrically estimated.

A few identities are used to close the model. They are as follows. A constant proportion technology between paddy and rice is considered. Paddy demand is considered to be equal to supply as imports of paddy are prohibited. The level of rice

imports was considered as the difference between domestic rice consumption and domestic rice production, adjusted for buffer stocks. Calorie contents of rice, wheat and millet were used to obtain the total calorie intake. As previously stated, the retail price of rice was linked to the world market price through a tariff barrier and other border charges.

Trade policy was simulated by changing tariff levels and by eliminating other border charges that affect the retail price of rice. Paddy procurement policy was simulated by changing the government involvement in procurement, which affects producer prices of paddy. The algebraic structure of the model is given below.

Demand Functions

$$D^r = D^r\left(P^r, \overline{P}^w, \overline{M}\right) \quad (1)$$

$$D^w = D^w\left(P^r, \overline{P}^w, \overline{P}^m, \overline{M}\right) \quad (2)$$

$$D^m = D^m\left(P^r, \overline{P}^w, \overline{P}^m, \overline{M}\right) \quad (3)$$

Per capita demand for rice (D^r), wheat (D^w) and millet (D^m) are functions of the price of rice (P^r), price of wheat (P^w) and price of millet (P^m) and expenditure on rice, wheat and millet (M).

Paddy Supply Function

$$S^p = S^p\left(P^p_{t-i}, \overline{P}^s, \overline{P}^f, \overline{T}\right) \quad (4)$$

Supply of paddy (S^p) is a function of lagged paddy price (P^p_{t-1}), price of seed paddy (P^s), price of fertilizer (P^f) and the time trend (T).

Price Linkage Equation

$$P^p = f\left(P^r, G\right) \quad (5)$$

Price of paddy is a function of price of rice and the ratio of paddy purchased by government agencies to total paddy output (G), which is a proxy for government intervention.

Paddy/ Rice Conversion

$$S^r = cf \cdot S^p \tag{6}$$

Supply of rice (S^r) is a constant proportion (*cf*) of rice production.

Rice Imports

$$IMP = \left(D^r \cdot \overline{pop} - S^R - \overline{STOCK}\right) \tag{7}$$

Imports of rice (*IMP*) is obtained by subtracting supply of rice and change in stocks (*STOCK*) from the total demand. Total demand is obtained by multiplying the per capita demand for rice and population (*pop*).

Tariff

$$P^r = \overline{P}^{rw}\left(1 + \overline{tariff} + \overline{Other}\right) \tag{8}$$

Domestic price of rice is determined by the world market price of rice (P^{rw}), tariff rate (*tariff*) and other border charges (*other*).

Calorie Intake

$$TOTCAL = ccr \cdot D^r + ccw \cdot D^w + ccm \cdot D^m \tag{9}$$

Total calorie intake (*TOTCAL*) is obtained using calorie contents of rice, wheat and millet (*ccr, ccw* and *ccm* respectively) and per capita demand for rice, wheat and millet.

Endogenous Variables

$$D^r, D^w, D^m, P^r, S^p, P^p, S^r, IMP, TOTCAL$$

Exogenous variables

$\overline{M}, \overline{P}^{w}, \overline{P}^{m}, \overline{P}^{s}, \overline{P}^{f}, \overline{T}, \overline{G}, \overline{cf}, \overline{pop}, \overline{STOCK}, \overline{P}^{rw}, \overline{tariff}, \overline{Other}, \overline{ccr}, \overline{ccw}$ *and* $\overline{ccm}$.

Policy variables

$\overline{G}, \overline{tariff}, \overline{Other}$

5.4 EMPIRICAL MODEL

Following Strotz (1957), it is considered that the consumer allocates expenditure among commodities in stages. In the first stage, the consumer allocates expenditure to a broad groups of commodities such as food and non-food items. In the second stage, the consumer is assumed to allocate expenditures within each of the broad groups to smaller subgroups (cereals, meat, vegetables, etc). This process continues as you progress along the various stages. This study considers the allocation of expenditure among cereals. The demand system includes three commodities, rice, wheat and millet to represent the three major cereals used in the Sri Lankan diet. It is assumed that the utility of cereal consumption is weakly separable from the utility derived from other commodities. Accordingly, an almost ideal demand system (AIDS) was developed for rice, wheat and millet. The algebraic form of AIDS is presented below, following Deaton and Muellbauer (1980). The AIDS in budget form is expressed as:

$$w_i = a_i + c_i \cdot \ln (E / \overline{P}) + b_{1i} \cdot \ln P_{1i} + b_{2i} \cdot \ln P_{2i} + d \cdot t \qquad (10)$$

where: w_i is the budget share of the i^{th} commodity, E is total consumption expenditure on rice, wheat and millet, Pi is the price of i^{th} commodity , and $\overline{P}$ is the price index defined by

$$\ln \overline{P} = a_0 + \sum_k \cdot a_k \cdot \ln P_i + 0.5 \sum_k \sum_j b_{ij} \cdot \ln P_i \cdot \ln P_j , \qquad (11)$$

and a_o, a_i, c_i, and b_{ij} are parameters to be estimated.

Deaton and Muellbaur (1980) suggest approximating the price index $\overline{P}$ by the Stone geometric price index, as shown below.

$$\ln \overline{P} = \sum_i w_i \cdot \ln P_i \qquad (12)$$

The adding up restrictions for the demand system requires,

$\Sigma_i a_i = 1$, $\Sigma_i c_i = 0$, $\Sigma_j b_{ij} = 0$, and $\Sigma_j d_i = 0$.

The homogeneity restriction is $\Sigma_j b_{ij} = 0$,

and the cross-equation symmetry restrictions can be imposed as

$b_{ij} = b_{ji}$ for $i \neq j$

The demand model presented above is a non-linear system. This system has three equations to be estimated. However, due to theoretical restrictions it is sufficient to estimate only two equations and other parameters can be calculated using theoretical restrictions. The expenditure (e_{iy}), own price (η_{ii}), and cross price (e_{ij}) elasticity values are derived as follows (Sadoulet and Janvry, 1995):

$\eta_i = 1 + c_i / w_i$,; $e_{ii} = -1 - c_i + b_{ii} / w_i$; $e_{ij} = b_{ii} / w_i - c_i / w_i * w_j$

The parameters were estimated using the two stage Least Square Estimation procedures in TSP version 4.2 (TSP International, 1997).

5.5 DATA

Data were obtained from government publications. Per capita consumption of rice, wheat and millet were obtained from the Food Balance Sheets published by the Food and Agriculture Organization of the United Nations (FAO). Retail prices of rice and wheat and farm-gate prices of paddy were obtained from the Statistical Abstracts published by the Central Bank of Sri Lanka. The retail price of millet was obtained from HARTI. Prices were deflated using Colombo Consumers Price Indices published by the Central Bank of Sri Lanka. Total paddy production, imports of rice, price of seed paddy, price of fertilizer, purchases of paddy under guaranteed price scheme and population were obtained from the Annual Reports of the Central Bank of Sri Lanka. The price of fertilizer was obtained from A. Bours and Company (a major private sector supplier of fertilizer). Descriptive statistics of the data used are presented in table 10.

Table 10—Per capita Calorie Consumption in Different Sectors

Variable	Units	Mean	Standard deviation
Consumption of rice	Kg./head/year	95.6828	6.2319
Consumption of wheat	Kg./head/year	43.9452	5.8325
Consumption of millet	Kg./head/year	0.5190	0.2262
Imports of rice	'000 Mt.	156.87	84.03
Paddy production	'000 Mt.	2,122.13	505.10
Retail price of rice	Rs./kg	13.54	7.01
Retail price of wheat	Rs./kg	10.34	4.74
Retail price of millet	Rs./kg	24.99	18.04
Farm-gate price of paddy	Rs./kg	4.79	3.39
Price of seed paddy	Rs./kg	139.48	108.90
Price of fertilizer	Rs./kg.	4.948	4,788.61
Colombo consumers price index	Index	801.65	356.49
Purchases under GPS	'000 Mt.	225.20	221.90
Population	'000	15,863.80	2,098.07

5.6 ECONOMETRIC RESULTS

5.6.1 The Demand System

The parameter estimates of the AIDS demand system and the elasticity estimate of demand evaluated using 1990 values, which shows the middle of the sample, are presented in tables 11 and 12 respectively. All the elasticity estimates of demand with respect to own prices have the expected negative sign and they are statistically significant at one percent level.

5.6.2 Paddy Supply Function

Paddy supply function was obtained through an econometric estimation using the following inverse equation.

$$PDN = 0.014 - 806{,}283.0/FGP_{-1} + 0.231E8/SP + 0.800E8/FP + 55{,}980.6/t; \quad (1)$$
$$(3.17) \quad (-2.77) \quad (2.18) \quad (0.61) \quad (6.22)$$
$$(R^2 = 0.75) \ (n = 29)$$

where:

PDN is paddy production, *FGP* is farm gate price of paddy (lagged by one year), *SP* is the price of seed paddy, *FP* is price of fertilizer and *t* is the time trend. The figures in parenthesis are t-statistics. The equation was estimated for the 1971-1999 period.

This form of the supply function implies that current production is determined by the product price that prevailed during the previous year. This relationship implies that current policy structure influences production in the next year. Elasticity estimates of paddy supply with respect to paddy price and input prices are also presented in table 12. The elasticity of supply with respect to own price has the expected positive sign and it is statistically significant. The supply elasticities with respect to input prices are negative and seed price elasticity is statistically significant.

Table 11—Parameter Estimates and Standard Errors of the AIDS model (1979-2000)

Dependent variable	Parameter	Estimate	Standard error	P-value
Rice share	Intercept	0.8269	0.6807	0.22
	Rice Price	0.0474	0.0267	0.07
	Wheat price	-0.0452	0.0265	0.08
	Expenditure	-0.0216	0.1376	0.87
Wheat share	Intercept	0.1307	0.6779	0.84
	Wheat price	0.0414	0.0264	0.11
	Expenditure	0.0257	0.1370	0.85

Table 12—Elasticity Estimates: Demand, Supply and Price Linkage

Type	Variable	Elasticity	P-value
Rice demand	Rice price	-0.9126	0.00
	Wheat price	-0.0543	0.44
	Millet price	-0.1279	0.08
	Expenditure	0.9700	0.00
Wheat demand	Rice price	-0.2355	0.00
	Wheat price	-0.8728	0.00
	Millet price	-0.0145	0.01
	Expenditure	1.0949	0.03
Millet demand	Rice price	0.1114	0.98
	Wheat price	0.8390	0.00
	Millet price	-1.2573	0.00
	Expenditure	0.3068	0.82
Paddy price	Rice price	1.004	0.00
Paddy supply	Paddy price	0.609	0.01
	Seed paddy price	-0.063	0.04
	Fertilizer price	-0.074	0.54

5.6.3 Price Linkage Equation

The price linkage equation is estimated by the following log-linear equation:

$$FGP = -0.776 + 0.982 \cdot RP + 0.004 \cdot Govt;$$
$$(33.85)\quad (10.88)\qquad (2.44) \qquad (2)'$$
$$\left(R^2 = 0.90\right)\left(n = 23\right)$$

Where *FGP* is a log of the farm-gate price of paddy, *RP* is a log of the retail price of rice and *Govt* is paddy purchased by government agencies as a percentage of the total output. All the coefficients are statistically significant. The equation was estimated for the 1978-2000 period. These results imply that the farm-gate price of paddy increases with an increase in rice price and that the price of paddy increases with an increase in the involvement of government agencies in purchasing paddy. The relationship contradicts the expectation that lack of government intervention (greater private buyer participation) improves the efficiency of the market due to competition among paddy buyers. High paddy prices due to government purchases suggest that in the absence of governmental intervention, private paddy buyers purchase paddy at lower prices, hinting a possible collusion among paddy buyers in the absence of government intervention.

5.7 SIMULATION RESULTS

Econometrically estimated equations were combined with a few identities discussed in the conceptual model to develop a model to be used in simulation. Data availability determined the period for simulation and it was 1979-1999.[4] The validity of the model was tested by comparing actual data with the predictions of the model for each endogenous variable. Validation statistics are shown in table 13. High correlation coefficients, low percentage root mean square errors and small bias are observed for all the variables except for imports that show a lower correlation coefficient and a higher percentage root mean square error. The model was therefore used for simulation experiments.

Table 13—Validation Statistics

Variable	Mean	Correlation Coefficient	Root Mean Square Error	Bias
Calorie intake	50,422	0.98	317.67 (0.628)	0.0001
Rice demand	95.68	0.88	2.79 (2.915)	0.0000
Wheat demand	43.94	0.80	3.41 (7.760)	0.0000
Rice imports	168,047	0.24	130,303 (77.53)	0.0002
Rice supply	1,681,600	0.64	140,836 (8.37)	0.0002
Paddy supply	2,402,285	0.64	164,882 (6.86)	0.0002
Paddy price	6.21	0.93	0.04 (0.644)	0.0009

Note: Figures in parenthesis are root mean square error as a percentage of the mean of the variable.

[4] Note that AIDS demand system was estimated for the 1979-2000 period and the paddy supply formula was estimated for the 1971-1999 period. These two equations restricted the period for the simulation experiments to be 1979-1999.

Table 14—Impacts of Trade Liberalization on Prices, Calorie Intake, Demand, Production and Trade (evaluated at the mean of the sample)

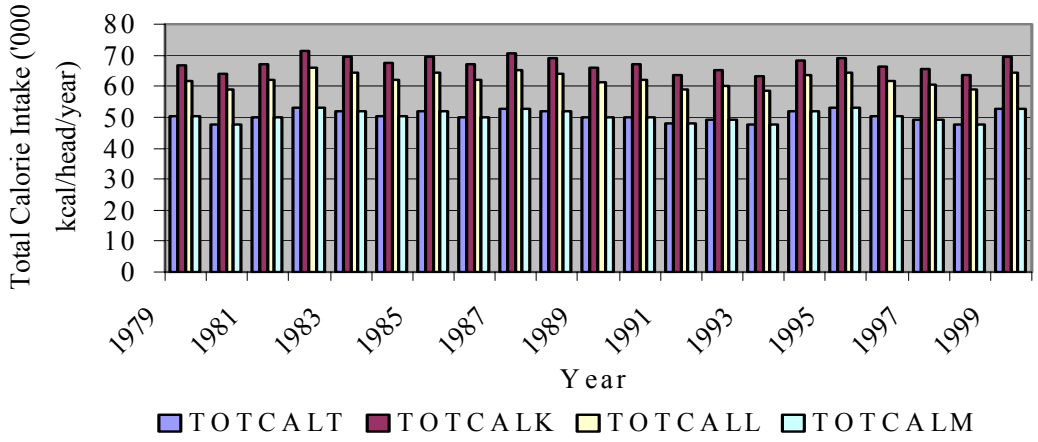
Variable	Units	Baseline Value	Policy Experiment		
			Removal of All Border Charges	Removal of Import Duties	No Government Purchases
Calorie intake	Calories/day	138.15	183.95	170.24	138.15
			(33.15)	(23.22)	(0.00)
Rice demand	kg/head/ year	95.67	139.17	126.03	95.67
			(45.47)	(31.74)	(0.00)
Wheat demand	kg/head/year	43.96	47.10	46.27	43.96
			(7.11)	(5.23)	(0.00)
Rice imports	Mt	188,540	1,016,823	1,027,466	208,365
			(704.21)	(490.31)	(5.43)
Rice supply	Mt	1,661,242	1,185,158	1,331,016	1,641,417
			(-28.28)	(-19.62)	(-1.28)
Paddy supply	Mt	2,373,203	1,693,084	1,901,451	2,344,882
			(-28.28)	(-19.62)	(-1.28)
Paddy price	Rs/kg	0.59	0.39	0.43	0.57
			(-34.03)	(-26.36)	(-2.15)

Note: Figures in parenthesis are percentage changes from the baseline value.

Three simulations were done to assess the impacts of liberalization. All border charges were removed in the first simulation. The second simulation was conducted by removing only import duties. Paddy procurement policy was simulated next by allowing only private sector procurement. Results are shown in table 14.

As expected, trade liberalization would have increased the demand for rice and calorie intake. It would also have decreased the price of paddy for the producer and therefore paddy and rice production levels should also have dropped. As a result, there would have been a need to increase imports. Removal of all border charges would have led to an increase of calorie intake by 33.15%. If only import duties were removed, the respective increase in calorie increase would be 23.22%. Figure 10 shows predicted and simulated values of calorie intake over the 1979-1999 period.

Figure 10—Predicted and Simulated Levels of Calorie Intake



TOTCALT: Total calorie intake predicted by the model

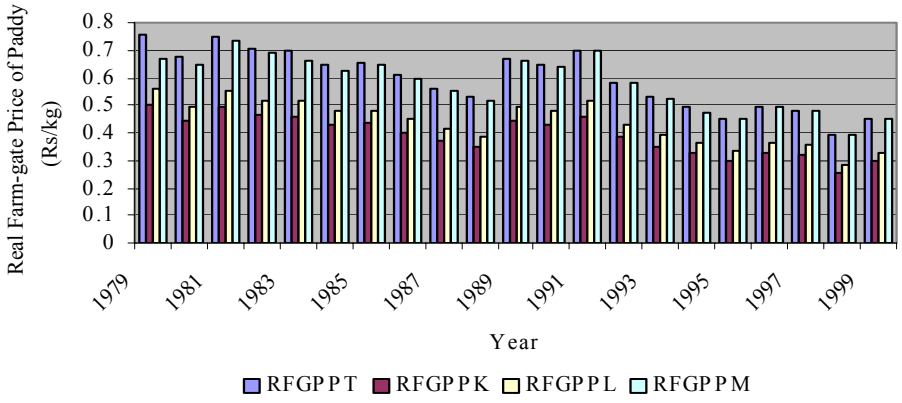
TOTCALK: Total calorie intake simulated with removal of all border charges

TOTCALL: Total calorie intake simulated with removal of import tariffs

TOTCALM: Total calorie intake simulated with no government purchases

If the government had no involvement in paddy purchases, the producer price of paddy would have declined by 2.15%, leading to a subsequent drop in production of paddy by 1.28%. It should be noted that in this simulation government purchases are set to be zero and the mean value of the government purchases during this period is rather small. As a result, the impacts are also small. Such a policy would not influence the demand-side variables, as it was considered that Sri Lanka could import any amount of rice at world market prices, subject to trade restrictions. Figure 11 and 12 show predicted and simulated values of price of paddy and production of paddy over the period 1979-1999.

Figure 11—Prices of Paddy: Predicted and Simulated



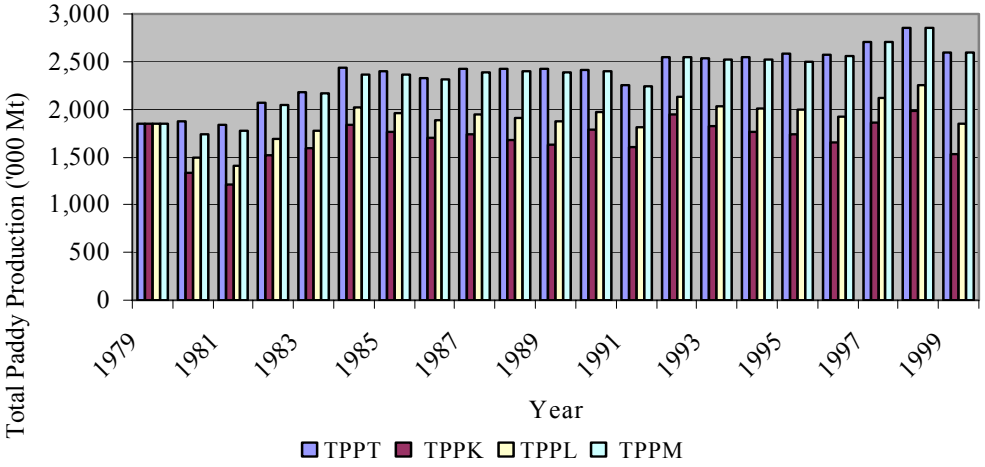
RFGPPT: Real farm-gate price of paddy predicted by the model

RFGPPK: Real farm-gate price of paddy simulated with removal of all border charges

RFGPPL: Real farm-gate price of paddy simulated with removal of import tariffs

RFGPPM: Real farm-gate price of paddy simulated with no government purchases

Figure 12—Production of Paddy: Predicted and Simulated



TPPT: Total paddy production predicted by the model

TPPK: Total paddy production simulated with removal of all border charges

TPPL: Total paddy production with removal of import tariffs

TPPM: Total paddy production with no government purchases

5.8 CONCLUDING REMARKS

This study clearly shows that if lower prices prevailed due to the absence of trade restrictions, calorie intake would have been higher. This suggests that trade liberalization can be used as a possible strategy to increase calorie intake. Yet, producer prices, which determine the income of the paddy producers, would have been lower. Such a reduction in incomes will lower the capacity of the farming community to purchase food, and it may offset some of the gains made by net consumers of food. Furthermore, if a price drop occurs, inefficient high cost producers will have to leave the industry. In Sri Lanka, paddy farmers with smallholdings are one of the poorest sections of the population, and therefore such an exit will have serious repercussions on poverty in the short term. The central question here is whether gains to consumers exceed losses to producers? According to the underlying assumptions of the model used in this study, there is a net gain as gains can compensate the losses and trade liberalization can increase economic efficiency. Using similar models, Rafeek and Samarathunga (2000) and Ekanayake (2003) show that rice-trade liberalization improves economic efficiency at national level. Furthermore, Weerahewa (2003b) shows that, gains to consumers exceed the losses to producers. This is due to the reduction in paddy and rice prices for households belonging to different income groups, sectors and provinces. This also indicates that there are efficiency gains from rice-trade liberalization at various other levels too. Although these earlier studies mention poverty impacts, no attempt has been made to quantify the socio-cultural and agronomic/environmental impacts of rice-trade liberalization. Policymakers need to consider such non-economic impacts as well in deciding on a correct level and mix of trade policy interventions. An important caveat to mention while interpreting the results of this study, however, is the fact that the model used is a static one and the dynamic effect of reduced income of paddy farmers, the resulting multiplier effects and impacts on the rural non-agricultural sector are not evident.

The results of the study also show that by reforming the market so that the private sector is the sole purchaser of paddy, producer prices will be further depressed. This could be due to the fact that lack of government interventions allows private paddy buyers to exercise oligopsony power on paddy sellers/producers who have a very low

bargaining power. The majority of paddy sellers in Sri Lanka are small-scale subsistence paddy farmers who do not have storage facilities and who need to sell the harvest immediately to repay loans obtained for cultivation and because of this their bargaining power is minimal. According to Rupasena (2002), the major reason attributed to low farm prices is that buyers are not competing with each other in pricing and offering low prices. Furthermore, the structure of the paddy market is such that the number of paddy millers is smaller than the number of paddy suppliers, allowing paddy millers to exert oligopsony power.[5] Further research is necessary to quantify the degree of market power, which is needed to identify the correct level of government intervention required. According to Dharmaratne and Hathurusinghe (1999), small paddy farmers are of the opinion that the government must purchase their total marketable surplus, and that the paddy-purchasing program of the government has been successful. Batuwitage (1999) indicates that paddy purchasing by PMB should be continued in order to overcome some of the problems in marketing. However, it should be noted that there was a policy failure to a certain extent even when PMB was in place. Small farmers faced many problems when they tried to sell paddy to the PMB (Dharmaratne and Hathurusinghe, 1999).

This study supports rice-trade liberalization because this strategy will decrease rice prices which is directly beneficial to consumers, as it increases calorie consumption. It is therefore argued that the government should minimize or eliminate import restrictions and encourage private sector importation of rice. However, at the same time, the government could monitor procurement of paddy from domestic producers, as past attempts at privatizing the domestic paddy-purchasing scheme have negatively affected both paddy prices and supply. This is mainly due to the inefficient nature of the domestic rice marketing structure (which is at the mercy of a few traders with monopolistic

[5] Existing literature does not provide conclusive evidence regarding the structure of the paddy marketing industry in Sri Lanka. Harrison (1995) stated that Sri Lanka had a competitive rice processing sector considering the number of rice millers in the industry. It should be noted that the number of firms in an industry is a weak indicator of market power. Strategic reactions among the firms determine the degree of market power. An industry with a large number of firms may exercise monopoly and monopsony power if all the firms decide to collude. In contrast, an industry with a small number of firms may act as a competitive industry if there is price competition among firms. According to Rupasena (2002), competitiveness in farm markets in Sri Lanka has been curtailed due to the prevalence of only a few traders.

powers). Therefore, it is also argued that the government should increase its presence in paddy procurement and thereby ensures that the interests of small-scale farmers (belonging to one of the lowest income groups in the country) are protected. Striking a right balance between government-private involvements in paddy/rice marketing is therefore imperative.

6. RICE TRADE LIBERALIZATION AND ITS IMPACT ON POVERTY IN SRI LANKA

6.1. INTRODUCTION

The rice/paddy sector and poverty in Sri Lanka are closely associated. There are differences between the rich and the poor as far as the consumption pattern of rice is concerned. Although rice is the major source of calories as well as a source of protein for both the rich and the poor, the calorie intake of the lowest and highest income deciles are 1964 and 2097 kilo calories, respectively (Department of Census and Statistics, 2002).

Furthermore, there are differences between the rich and the poor as far as income from paddy is concerned. The incidence of poverty (head count ratio) at national level was reported at 25.17% in 1995/96 with a poverty line of Rs 791.61 per person per month (Gunawardena, 2000). The rural sector, where paddy farming is mostly carried out, has continued to report figures above the national average in all three widely used poverty measures during three consecutive surveys conducted with five-year intervals: 1985/86, 1990/91 and 1995/96. Table 15 presents the status of poverty in 1995/96 using different indicators. Also, according to the Department of Census and Statistics, high incidences of poverty are recorded in provinces with high rural populations such as Uva, Northwestern and Sabaragamuwa (Table 16).

Table 15—Poverty by Sector, 1995/96

Sector	Indicator*					
	Incidence		Depth		Severity	
	Index	Contribution	Index	Contribution	Index	Contribution
Urban	14.67	8.11	2.95	7.64	0.91	7.31
Rural	26.95	88.20	5.79	88.97	1.88	89.35
Estate	24.92	3.69	4.88	3.39	1.55	3.33
All	25.17	100.00	5.36	100.00	1.73	100.00

Source: Gunawardena, 2000
Note: * based on reference poverty line of Rs 791.67 per person per month.

Table 16—Provincial Differences in Poverty in 1995/96 (Poverty Line Rs 791.67 Per Person Per Month)

Province	Agricultural households as a % rural households*	Indicator					
		Incidence		Depth		Severity	
		Index	Contribution	Index	Contribution	Index	Contribution
Western	15.6	14	17	3	15	1	14
Central	45.3	28	17	6	18	2	19
Southern	42.4	26	16	6	16	2	16
Northwestern	48.0	34	18	7	17	2	16
Northcentral	82.6	31	8	6	7	2	7
Uva	75.9	37	11	9	13	3	15
Sabaragamuwa	51.1	32	14	7	14	2	14

Source: Gunawardena, 2000 and SLIS, 1999-2000
Note: * based on the reference poverty line of Rs 791.67 per person per month.

According to Gunawardena (2000), the poor are more likely to be wage earners or receive income from agricultural income, less likely to receive income from non-farm self employment, less likely to receive pensions and foreign remittances, and are more likely to receive income from Janasaviya and Samurdhi[6] payments. Table 17 shows poverty by type of income. Also, it is stated that only 22% of the population own paddy land and that there appears to be an association between poverty and the size of paddy land holdings (Table 18)[7].

[6] Poverty alleviation schemes launched by successive Sri Lankan governments.
[7] An exception is the higher poverty incidences reported for the >20 category, Gunawardena (2000) does not indicate why it was high.

Table 17—Poverty by Source of Household Income

Household Type	Incidence of Poverty*	Gini**	Average Consumption Expenditure
Wage income only	23.86	0.334	1,436.77
Agricultural self employment only	26.73	0.282	1,221.19
Non-agricultural self employment income only	13.56	0.346	1,715.99
Agricultural and non-agricultural self employment income only	22.17	0.310	1,380.53
Wage and self employment income	28.09	0.316	1,289.85
No earned income	18.58	0.359	1,794.28

Source: Gunawardena, 2000
Note: * based on the reference poverty line of Rs 791.67 per person per month.
**Gini coefficient is based on Lorenz curve and is commonly used measure of inequity. The value of Gini coefficient ranges between 0 and 1. A zero value shows a completely equal distribution (Lorenz curve is located on 45 degree line so that the area between 45 line and Lorenz curve is zero). The greater the value of Gini, the greater the degree of inequity in distribution.

Table 18—Poverty in Sri Lanka by Size of Paddy Land Holding, 1995[8]

Landholding Size (Acres)	Incidence of Poverty*	Mean Consumption
Landless	27.47	1,280.04
0 – <1/8	24.86	1,125.23
1/8 –< ¼	24.85	1,185.09
¼ - <½	24.11	1,234.53
½ - <1	28.66	1,269.58
1 – <2	24.08	1,328.82
2 – <3	24.72	1,311.11
3 – <4	18.74	1,413.68
4 – <5	10.86	1,940.08
5 – <10	11.65	1,964.52
10 – <20	15.62	1,934.07
> 20	33.47	1,701.19

Source: Gunawardena, 2000
Note: * based on the reference poverty line of Rs 791.67 per person per month.

The protection given by the interventions can be measured by the nominal rate of protection (NRP), the ratio of the domestic price over the border-equivalent price, and by the effective rate of protection (ERP), the ratio of value added under existing intervention over value added at the border price. The NRP and ERP for rice were 25.1% and 25.8% for 2000. These numbers indicate that import restrictions were much more important than

[8] In Sri Lanka paddy is cultivated mainly in low lands. Some areas are irrigated and others are rainfed.

various supports on traded input in providing protection to the farmers (Epparachchi *et al.,* 2002). However, we must also bear in mind that international prices in the year 2000 were abnormally low, such that prices in many countries including India and Thailand were found to be 25% above the world price.

NRP and ERP values greater than one imply that the Sri Lankan rice sector is not competitive. Hence, with liberalization, imports would flow into the country, pulling down domestic prices to the world level—an advantage to consumers. Paddy producers will loose. While this type of policy increases the economic efficiency, impacts on poverty are less apparent as there are poor producers as well as poor consumers. The purpose of this study is to assess the poverty impacts of rice-trade liberalization in Sri Lanka.

Literature provides ample evidence regarding the impact of trade liberalization on poverty. McCulloch *et al.,* (2001) provide a framework to explain links between trade liberalization and poverty and show how countries and liberalizations are likely to vary from case to case. According to ESCAP (1996) liberalization policies pursued by China, India, Indonesia, Malaysia, Thailand and Vietnam have made positive impacts on their economies. Gulati and Narayanan (2002) indicate that rice trade liberalization has tremendous implications for poverty as 70% of the poor in Asia are engaged in paddy production. They predict that there will be beneficial effects for poverty through producer price increases in exporting countries and through consumer price decreases in importing countries. Deaton (1989) observed that an increase in rice prices in Thailand would benefit all rural households. Minot and Goletti (2000) predicted that elimination of the rice export quota in Vietnam would raise prices and could be expected to reduce both the incidence and depth of poverty. This study analyzes the impacts of liberalization of rice trade, on the status of poverty in Sri Lanka, which is a net rice importing country. It considers the importance of paddy and rice as a source of income and an expenditure item of the poor. It shows the impacts of rice-trade liberalization on different groups of households at an average level.

The chapter is organized as follows. The next section provides a description of the trade policies implemented in the recent past. The following section shows the status of income generation by paddy farming. The methodology and data used in the analysis are presented next. Impacts of rice-trade liberalization at different levels are discussed next. This is followed by the conclusions.

6.2 RICE TRADE POLICY

Until 1990, the Food Commissioner's Department (FCD) had the monopoly power in rice imports but later this was given to the Cooperative Wholesale Establishment (CWE). This government monopoly in importing rice continued until 1993. In 1993, the private sector was allowed to import rice under licenses. In 1996, this licensing scheme was removed and anyone was allowed to import rice at anytime at a specified duty (Rupasena and Ravichandran, 2000). In 1997, the rice trade experienced a considerable degree of uncertainty and prices varied excessively during the year as trade policy relating to rice remained unpredictable (Central Bank of Sri Lanka, 1998). Even with a supply shortage in 1997, this unpredictable policy environment prevented private sector importers from importing rice. Only for the fourth quarter of 1997, a duty wavier was granted for a short period enabling more rice imports. However, due to this uncertainty bondsmen did not maintain any buffer stocks during 1997.

Of the 168,000 metric tons (MT) imports of rice in 1998, 75% of the imports were during the month of January. This is mainly due to the duty wavier introduced to reduce the escalating price of rice in the domestic market. However, this duty wavier did not continue during the latter part of 1998, as the government's main aim was to protect farmers' interests by stabilizing paddy prices at a reasonable level. Rice imports during 1999 amounted to 214,000 MT. Over two thirds of the imports were during the months of November and December. During this period, a partial reduction of duty on imports was granted with a view to stabilize domestic rice prices. The reduction of import duty on rice was 10-35% and was effective from 23 October 1999 to 31 December 1999.

In July 2000, the licensing scheme was re-imposed on the import of rice and continued until 22 November 2001. The government once again intervened in the market and allowed the private sector and the CWE to import 60,000 MT of rice on a duty-free basis. This decision was taken due to escalating rice prices in the market that were caused as a result of shortfalls in paddy production. Of the imports, CWE was allowed to import 30,000 MT, while the balance was equally distributed among 15 private sector importers. However, only the private sector importers had imported the full quota of 30,000 MT of rice while the CWE had imported only a portion of the allocated quantity before 10 December 2001. After the 10 December to 31 December 2001 period the duty rate applicable for importing rice has changed from duty free to 50% of the normal duty.

The ad-voleram import duty was changed to a specific duty of Rs 7.00 per kilogram with effect from 21 January 2002. However, CWE was allowed to import at a reduced duty of Rs 4.00 per kilogram. The specific duty was reduced to Rs 5.00 per kilogram with effect from November 2002.

This shows that rice-trade policy has not been very stable in Sri Lanka. The main objective of the government has been to protect the paddy producer through trade policy, although at times tariff concessions were given to lower the rice price to relieve the pressure on consumers. The next section shows that the rice-trade policy has only marginally helped in improving the income from paddy farming.

6.3 INCOME FROM PADDY FARMING

According to Ranaweera (1990), income from paddy farming has been declining over the years and paddy farmers do not receive a sufficient income to meet their basic needs. A more recent study by Weerahewa *et al.,* (2003) also indicates the same. This section summarizes the findings of the latter study.

An evaluation of income from paddy farming was done using *maha* (major cultivation season) data for 1980/81, 1990/91 and 2000/01 to assess the changes over the last two decades. Income obtained from paddy farming per year was compared with the income of an average Sri Lankan family. Table 19 shows the income from paddy

farming and average per capita income in respective years in nominal and real terms. The analysis suggests that, the income of a paddy farmer with 1 acre is 20% of the average income of the country in 1980/81 and that it was 10% in 1990/91. The value is only 5% in 2000/01 suggesting that the status of a small paddy farmer who possess only 4 acres of lowland, has deteriorated significantly over the years.

Table 19—Comparison of Income from Paddy Farming over the Years

Year	Units	1980/81	1990/91	2000/01
Nominal income from irrigated paddy	Rs/ac/season	2,371.91	4,706.50	8,781.95
Colombo consumers price index	Index	318.20	1,008.60	2,539.80
Real income from irrigated paddy	Rs/ac/season	18,932.03	11,851.64	8,781.95
Real income from irrigated paddy[1]	Rs/ac/year	37,864.05	23,703.29	17,563.90
Gross domestic product in market prices	Rs million	66,527.00	321,784.00	1,255,535.00
Population	million	14.747	17.015	19.36
Per capita income in market prices	Rs	4,511.22	18,911.78	64,855.36
Real per capita income	Rs	36,007.55	47,622.59	64,855.36
Average income per household[2]	Rs	180,037.76	238,112.97	324,276.82
Paddy income/per capita income of a household*($^1/_2$)	Ratio	0.21	0.10	0.05

Source:Weerahewa et al. (2003)
* Obtained by dividing real income from paddy (assuming one acre is cultivated) by the avery income per household.

Table 20 shows the profitability of irrigated paddy farming including and excluding family labor in different districts. Irrigated paddy farming was taken here to represent the best-case scenario. On average, with profit excluding family labor, the income of a paddy farmer is Rs 8,781.95 per acre per season in 2000/ 01. If the same income can be obtained by cultivating paddy in the same land in the following season, the income for a farmer who possess 1 acre, will be Rs 17,563.90 per year. Even if the farmer possesses 4 acres, he could obtain an annual income of Rs 70,255.60 allowing him to be just above the poverty line[9]. This calculation considers that demand for family labor could be met by the family, even if 4 acres of paddy are cultivated. It should be noted that the majority of paddy farmers in Sri Lanka have an extent of less than two acres, giving them an annual income less than Rs 35,127.80 from paddy alone. These

[9] Assuming a poverty line of 1000.00 Rs per month per person in 2000/01 poverty line for a household with 5 members will be 1000.00*5*12= Rs 60,000.00 per household per year.

numbers indicate that cultivating paddy alone does not allow a farm family to overcome poverty. Thus, it is evident that the paddy sector is unable to generate reasonable family income with the current land holding size.

Table 20—Profitability of Paddy Farming in Different Districts of Sri Lanka over the Years

District	1980/81		1990/91		2000/01	
	Profit (rupees per acre per season)		Profit (rupees per acre per season)		Profit (rupees per acre per season)	
	Including imputed cost*	Excluding imputed cost*	Excluding imputed cost	Including imputed cost	Including imputed cost	Excluding imputed cost
Anuradhapura	1,496.94	2,042.26	4,709.00	2,522.00	2,570.16	7,767.11
Polonnaruwa	1,304.84	2,113.81	2,167.00	635.00	5,275.29	10,005.65
Kurunagala	1,908.71	2,533.55	7,779.00	5,257.00	3,815.80	9,507.26
Hambanthota	2,483.47	2,798.01	4,171.00	2,427.00	2,786.11	7,847.77
Average	1,798.49	2,371.91	2,710.25	4,706.50	3,611.84	8,781.94

Source: Cost of Cultivation of Agricultural Crops: 1980/81, 1990/91 and 2000/2001 maha, Department of Agriculture.
Note: *Imputed cost consists only of family labor.

Table 21 shows income from paddy farming simulated under different incentive structures. The second column shows the actual profit levels calculated using values reported in cost of cultivation reports for a 2 acre farm which cultivate both seasons. The third column shows the income of paddy farming with a 50% import tariff. These income levels were obtained by increasing the base income levels by 15%, as the base tariff level was 35%. Note that the tariff increase and resultant increase in consumer price of rice may not necessarily increase farmer income. For example, in early 2003, one kilogram of paddy was sold in the production areas for Rs 13.00 per kilogram. Given a conversion ratio of 0.7, the rice price equivalent to paddy is Rs 18.57 per kilogram. The retail price of rice in the market is between Rs 35.00-45.00 per kilogram implying that the marketing margin is unacceptably large. Therefore, tariff increases may not be necessarily a good measure to augment farm income, given the marketing structure in the sector. These scenarios are taken to show that protectionism is not a good solution for augmenting paddy farm income even disregarding the impact on consumers. The fourth

column of table 21 shows income from paddy farming if fertilizer is provided free of charge. The fifth column shows income levels with free provision of fertilizer and under higher import tariffs. The results show that under none of these incentive structures, paddy farming generates a sufficient income or provide a reasonable income for living.

Table 21—Income from Paddy Farming Simulated under Different Incentive Structures (Rs/Year for a Two Acre Farm)

District	Actual	With 50% Tariff	With Free Fertilizer	With Free Fertilizer And High Tariff
Anuradhapura	38,864.00	44,693.60	47,315.04	54,412.15
Polonnaruwa	47,316.00	54,413.40	55,701.84	64,057.12
Kurunagala	30,308.00	34,854.20	38,308.00	44,463.51
Hambanthota	18,516.00	21,293.40	27,230.88	31,315.51
Average irrigated	33,751.00	38,813.65	42,227.92	48,562.11

Source: Weerahewa et al (2003).

Table 22 shows income from paddy farming with a deficiency payment scheme. Income from paddy farming was assessed under hypothetical paddy prices considering the cost of production as Rs 15,000.00 per acre and average yield as 2,000 kilograms per acre. Government expenditure on the program was assessed too, considering paddy production in Sri Lanka is 2,860 million kilograms and market price of paddy as Rs 13.00 per kilogram. Table 22 shows that, a paddy farmer with 4 acres can earn an income comparable to the average income of a Sri Lankan, when paddy price is raised to Rs 30 per kilogram. This involves a huge subsidy of Rs 48,680.00 million. A deficiency payment system can maintain both consumer and producer welfare. However, given the current economic status of the country, it will add an unmanageable budget deficit and this solution is certainly not politically appealing.

Table 22—Income from Paddy Farming with a Deficiency Payment Scheme

Price (Rs/kg)	Income Per Acre (Rs/season)	Income Per Acre (Rs/year)	Income Per Two Acre (Rs/year)	Income Per Four Acre (Rs/year)	Government Expenditure (Rs million/year)
13.00	11,000.00	22,000.00	44,000.00	88,000.00	0.00
15.00	15,000.00	30,000.00	60,000.00	120,000.00	5,720.00
20.00	25,000.00	50,000.00	100,000.00	200,000.00	20,020.00
25.00	35,000.00	70,000.00	140,000.00	280,000.00	34,320.00
30.00	45,000.00	90,000.00	180,000.00	360,000.00	48,680.00

Source: Weerahewa et al. (2003).

The above discussion shows that paddy farming when it is practiced as a mono crop cultivation on a small scale cannot provide a sufficient income for farmers. Also, the study shows that it needs to be done on a large scale to reap the benefits of economies of scale. Furthermore, it is clear that small farmers earn only modest returns from paddy cultivation.

6.4 METHODOLOGY

The method proposed by Nicita et al., (2002) to assess the poverty impacts of liberalization programs, and later used by McCulloch (2002) to demonstrate the method and Weerahewa (2003) to assess the impacts of rice trade liberalization at provincial level is used for the analysis. The detailed model is provided in the appendix.

The model can be explained as follows. The impacts of rice-trade liberalization, which lowers paddy and rice prices, are determined by the relative importance of rice/paddy in the expenditure and income of a household. If a particular group depends more on paddy as an income source, there will be very high losses due to rice-trade liberalization. Similarly, if a particular group spends a considerable share of expenditure on rice, there will be very high gains due to rice-trade liberalization. Whether a particular group gains or losses due to rice trade liberalization is determined by the relative difference between income share and expenditure share of that group. It is generally considered that poor people, especially in urban and estate areas, spend more on rice compared to other groups. Also, agricultural households in rural areas depend very

heavily on paddy as an income source relative to other groups. Whether rice-trade liberalization helps the poor or not therefore is an empirical issue.

6.5 DATA

Following is a description of differences in income and expenditure shares among different groups in Sri Lanka.

6.5.1 Expenditure and Income Shares by Income Group

Following Gunawardena (2000), households were classified by the level of consumption expenditure. Poor are defined as the households who live below the higher poverty line (Rs 950.00 per person per month). Very poor is defined as the households below the reference poverty line (Rs 791.67 per person per month). Non-poor are the households who lie above the reference poverty line. Food expenditure is a much large share of the household budget for the poor and very poor. Rice comprises the largest share, and shows a decreasing share with increasing consumption expenditure (Gunawardena, 2000). Table 23 shows the expenditure shares.

Table 23—Share of Different Items in Total Expenditure by Different Income Groups, 1995/96

Group	Rice	Other Food	Non Food
Poor (below the higher poverty line)	20.51	54.53	24.96
Very poor (below the reference poverty line)	21.77	54.44	23.79
Poor excluding very poor	18.90	54.64	26.46
Non poor	10.11	46.95	42.94
All	12.23	48.48	39.29

Source: Calculated using the shares provided by Gunawardena (2000).

Data on income from rice is not directly available and hence income from agriculture is presented below. Agricultural income, which includes income from cultivation of paddy, tobacco, chilies, onions, vegetables and fruits, is important to the poor and very poor more than to the non poor (Table 24). Also for the poor, the share of

income from government transfer programs, Janasaviya and Samurdhi, exceed the earnings from agriculture.

Table 24—Share of Different Items in Total Income by Different Income Groups, 1995/96

Group	Agriculture	Samurdhi/ Janasaviya	Other Sources
Poor (below the higher poverty line)	7.7	9.85	82.45
Very poor (below the reference poverty line)	7.57	11.23	81.20
Poor excluding very poor	7.9	7.64	84.46
Non poor	4.97	3.27	91.76

Source: Calculated using the shares provided by Gunawardena (2000).

6.5.2 Expenditure and Income Shares by Sector

Consumption patterns among sectors show that households in the estate sector have the biggest expenditure share on rice. It is lowest in the urban sector (Table 25). Income patterns are such that rural households have the highest income share from agriculture among all sectors (Table 26). Except in the case of the rural sector, share of income from government transfer programs is much higher than that from agriculture. As in the case of different income groups, because income from rice is not available, income from agriculture is given here.

Table 25—Share of Different Items in Total Expenditure by Sector, 1995/96

Sector	Rice	Other food	Non food
Urban	5.18	32.33	62.50
Rural	10.89	39.51	49.60
Estate	14.87	52.13	33.00

Source: Calculated using data from the Consumer Finances and Socio-Economic Survey 1996/97 of the Central Bank of Sri Lanka.

Table 26—Share of Different Items in Total Income by Sector, 1995/96

Sector	Agriculture	Samurdhi/ Janasaviya	Other sources
Urban	0.20	1.43	98.37
Rural	6.97	6.31	86.72
Estate	1.39	1.28	97.33
All	5.90	5.51	88.59

Source: Calculated using the shares provided by Gunawardena (2000).

6.5.3 Expenditure and Income Shares by Provinces

Expenditure shares and income shares at provincial level were obtained from the Consumer Finance and Socio-economic Survey of Central Bank and the Sri Lanka Integrated Survey (1999-2000) respectively. As shown earlier, according to Gunawardena (2000) the highest incidence of poverty is observed in the Uva province (55%) and the lowest incidence of poverty is observed in the Western province (23%). These incidences are reflected in the pattern of income and expenditure. Share of food expenditure and share of rice expenditure as a percentage of total expenditure are 56.2 and 14.1% respectively in the Uva province and are the highest among all provinces. Contrary to this, these values are 41.8% and 6.5% in Western province and are the lowest among all provinces (Table 27). Differences in poverty incidences are reflected in differences in income as well. The percentage of farm income is highest in the Uva province (41.4%) and is lowest in the Western province (6.5%). Percentage of land under cultivation for rice was used to approximate the income from rice. Though the area under rice is highest as a percentage of total area cultivated, income from rice is as low as 2.66% in the Western province. Income from rice is approximately 7% in Uva and Sabaragamuwa provinces (Table 28).

Table 27—Consumer Expenditure Shares (1996/97)

Province	Rice	Other food	Non food
Western	6.50	35.30	58.20
Central	10.90	39.60	49.50
Southern	11.80	42.40	45.80
Northwestern	13.20	42.60	44.20
Northcentral	13.00	41.70	45.30
Uva	14.10	42.10	43.80
Sabaragamuwa	12.30	39.00	48.70
All	9.90	38.50	51.60

Source: Consumer Finances and Socio-economic Survey 1996/97 of the Central Bank of Sri Lanka.

Table 28—Average Percentage Share of Different Sources of Income to Total Rural Household Income[10]

Province	Area under rice	Agriculture		Samurdhi	Other Sources Except Rice and Samurdhi
		Farm	Rice		
Western	41.0	6.50	2.66	1.90	95.43
Central	31.0	13.80	4.27	5.30	90.42
Southern	33.5	20.80	6.96	3.70	89.33
Northeastern	44.0	29.00	12.76	2.30	84.94
Northwestern	22.4	10.50	2.35	4.70	92.94
Northcentral	22.3	26.40	5.88	6.90	87.21
Uva	18.6	41.40	7.70	6.80	85.49
Sabaragamuwa	25.3	29.40	7.44	4.30	88.26
All	28.3	17.80	5.11	3.60	91.29

Source: SLIS 1999-2000.

6.6 RESULTS AND DISCUSSION

The following section shows the efficiency gains of rice-trade liberalization to different groups of households. In order to assess the impacts of rice-trade liberalization, prices of rice and paddy after trade liberalization need to be identified. Current specific duty of Rs 5.00 per kilogram on rice is equivalent to a 25% tariff, as the cost insurance

[10] Note that the percentage shares of different sources of income to total household income reported by SLIS (1999/2000) is very different from Central Bank (1996/1997) as the coverage of two surveys and the time periods are different. SLIS covers the entire island and the Central Bank does not include the North and the East

freight (CIF) of rice is approximately Rs 18.00 per kilogram. Therefore, trade liberalization was modeled as a drop in prices of rice and paddy by 25% considering a perfect price transmission. Also Epaarachchi *et al.,* (2002), state a NRP of 25% for rice in year 2000.

As stated earlier, due to differences in income shares and expenditure shares, different households experience different impacts on income and expenditure levels due to a change in price. The following section shows the changes in income, changes in expenditure and changes in welfare in percentage terms resulting from a drop in price by 25%. Changes in income and changes in expenditure are always negative as a price drop is considered. Change in welfare is obtained by subtracting "change in expenditure" from "change in income". If it is positive, it indicates that on average, loss in income can be compensated by the drop in expenditure, and hence there is a net gain due to rice-trade liberalization. The higher the "change in welfare", the higher the benefits of trade liberalization.

6.6.1 Impacts by Income Group

While all the income groups gain, the very poor people will obtain the highest welfare gain from trade liberalization and hence rice-trade liberalization can be called pro-poor. The lowest gain will be for the non-poor, as they spend only a small portion of their income on rice and they get a very small share of their income from agriculture[11] (Table 29). Results also show that the poor, excluding the very poor incur the highest losses. The highest reduction in expenditure is recorded for the very poor group.

6.6.2 Impacts by Sector

While all sectors gain from rice-trade liberalization, the estate sector gains the most (Table 30). The estate sector records the second highest incidences of poverty in Sri Lanka—hence, trade liberalization can alleviate poverty to a certain degree. Although

[11] Note that the share of income from agriculture was used in the analysis due to non-availability of share of income from rice. This must have over-estimated the losses and under-estimated the net gains from rice-trade liberalization.

paddy is one of the key income-generating activities, on average, a considerable portion of expenditure is incurred on rice in the rural sector. As a result, even the rural sector has a net gain from rice-trade liberalization—though on average it incurs the highest income loss among the sectors (Table 30).

Table 29—Impacts of Rice-Trade Liberalization by Income Group (Percentage Changes)

Income Group	Change in Income	Change in Expenditure	Change in Welfare
Poor (below the higher poverty line)	-1.93	-5.13	3.20
Very poor (below the reference poverty line)	-1.89	-5.44	3.55
Poor excluding very poor	-1.98	-4.73	2.75
Non poor	-1.24	-2.53	1.29

Table 30—Impacts of Rice-Trade Liberalization by Sector (Percentage Changes)

Income Group	Change in Income	Change in Expenditure	Change in Welfare
Urban	-0.05	-1.29	1.24
Rural	-1.74	-2.72	0.98
Estate	-0.35	-3.72	3.37

6.6.3 Impacts by Province

All the provinces too show a gain from rice-trade liberalization[12]. The Northwestern province gains the most (Table 31). As the Northwestern province is a province with high incidences of poverty, rice-trade liberalization can be called pro-poor. On average, a drop in price reduces the income of households by 1.28%. Depending upon the share of income from rice, the reduction could be as high as 1.93% in Uva province and as low as 0.59% in the Northwestern province in which only a small

[12] Due to unavailability of data the Northeastern province was not included in the analysis.

proportion of land is under rice. The producers in Uva and Sabaragamuwa incur the biggest losses. The impacts of this price drop on expenditure also differ among provinces. On average, it reduces expenditure by 2.48%. The highest reduction is shown in the Uva province (3.53%) and lowest is in the Western province (1.63%).

Table 31—Impacts of Rice-Trade Liberalization by Province (Percentage Change)

Province	Change in Income	Change in Expenditure	Change in Welfare
Western	-0.67	-1.63	0.96
Central	-1.07	-2.73	1.66
Southern	-1.74	-2.95	1.21
Northwestern	-0.59	-3.30	2.71
Northcentral	-1.47	-3.25	1.78
Uva	-1.93	-3.53	1.60
Sabaragamuwa	-1.86	-3.08	1.22
All	-1.28	-2.48	1.20

6.6.4 Impacts by the Size of Paddy Holdings

Data on income shares from paddy and expenditure shares on rice by farmers are needed to quantify the impacts of rice-trade liberalization by the size of paddy holding, using the above methodology. Due to lack of data impacts by the size of holdings were inferred by considering the size of paddy holding required to meet the rice requirement of an average family.

If an average family consists of 5 members and rice requirement per person per year is 96 kg (Food Balance Sheets, 2000), then family rice requirement is 475 kg/year. This is equivalent to 679 kg of paddy per year (assuming a conversion ratio of 0.7). The average yield of paddy is approximately 3.856 metric ton/ha (1,560 kg/acre), and hence a 0.217 acre plot is sufficient to meet the family needs if two seasons were cultivated with paddy. Those who cultivate more than 0.217 acres are the net-sellers of paddy.

The distribution of paddy land holdings indicates that approximately 7.5% of the paddy farmers possess holdings with less than 0.217 acres (Gunawardena, 2000). This

indicates that the rest of the farmers incur net losses due to rice-trade liberalization. Of the paddy farmers, inefficient farmers may incur higher losses. According to Weerahewa *et al.,* (2003) farmers with an extent of less than 2 acres are inefficient. Therefore, the biggest adverse impact of trade liberalization will be on the farmers with an extent of more than 0.217 acres and less than 2 acres.

6.7 CONCLUSIONS AND POLICY IMPLICATIONS

The section on "income from paddy farming" illustrated that protectionist measures like higher tariffs, subsidies on inputs, etc. can marginally help in increasing the income from paddy farming, and hence their contribution to poverty alleviation among paddy farmers is marginal. In contrast, the results of the present study reveal that the liberalization of the rice trade would not only improve economic efficiency, but would also help to alleviate poverty in certain categories. On average, there will be gains from rice-trade liberalization for all the provinces, for all income groups and for all sectors. The highest gains will be for the estate sector among the sectors, for the very poor people among the income groups and for the Northwestern province among the provinces. Even though the analysis was restricted to few categories mentioned above, based on the efficiency gains it could be concluded that rice-trade liberalization is a viable strategy.

As in the case of many policies, there will be gainers and losers due to trade liberalization. As Sri Lankan rice producers are relatively inefficient, consumers will gain, and producers will loose. Consumers may not reap the gains from rice-trade liberalization if the market is imperfect. Further research is necessary to assess the imperfections in the marketing system if any.

Due to income loss for the present paddy farmers resulting from rice-trade liberalization, there will be serious repercussions on absolute poverty—at least in the short run. The biggest loss will be incurred by farmers in the rural areas of Uva and Sabaragamuwa provinces who belong to the "poor excluding very poor" income group. Also such impacts will be more visible among small-scale farmers with an extent of little more than quarter acre of paddy. Further research is necessary to determine actual losses

to these farmers. However, the result of this study is indicative of such losses. Therefore it is recommended that along with reforms to liberalize rice trade, income transfers should be provided for such farmers to meet their basic needs. Vocational training can also be provided to help them acquire new skills, which would allow a smooth transition of workers from paddy farming to other industries.

6.8 APPENDIX

A Methodology to Analyze the Impacts of Rice Trade Liberalization

McCulloch (2002) who draws on the approach of Nicita *et al.,* (2002) in their study of the impact of trade reform in Cambodia as the basic methodology proposes the following framework. When the income *Y* of a household be given by:

$$Y = \left(\sum_j p_j^O q_j^O - \sum_k p_k^I q_k^I \right) + \sum_f w_f L_f + \sum_m \sum_n T_{mn} \qquad (1)$$

where p_j^O is the price of output j; q_j^O is the quantity of output j; p_k^I and q_k^I are the corresponding input prices and quantities; w_f is the wage rate for factor *f*; L_f is the net sale of factor *f* by the household; and T_{mn} is the net transfer received by household member n from source m.

Note that the first term in equation (1) is the value added of all production (whether from farming or non-farming enterprises). This includes both marketed production and own consumption. The second term is the value of net factor sales by the household—in the case of most poor households this simply means net labor sales (i.e., employment income minus payments for hired labor) since the only factor which most poor households can sell is their own labor. The final term represents the net transfers received by the household.

Similarly we can write the consumption of the household as:

$$C = \sum_i p_i^C q_i^C \tag{2}$$

where p_i^C is the buying price of good *i* and q_i^C is the quantity consumed of good *i.* Note that q_i^C includes own consumption as well as goods purchased from the market.

It is then possible to simulate the impact on household income of price changes induced by structural reforms. In the short run we can assume that all quantities remain fixed so that:

$$\Delta Y = \left(\sum_j \Delta p_j^O q_j^O - \sum_k \Delta p_k^I q_k^I \right) + \sum_f \Delta w_f L_f + \sum_m \sum_n \Delta T_{mn} \tag{3}$$

Similarly the change in consumption assuming that quantities remain fixed is

$$\Delta C = \sum_i \Delta p_i^C q_i^C \tag{4}$$

It is possible to show that a first order approximation of the change in money metric utility resulting from a change in the price of a commodity can be given by [13]

$$\Delta MMU = \Delta Y - \Delta C \tag{5}$$

This makes intuitive sense: an increase (say) in the price of a good which is both produced and consumed will increase income and also increase the cost of achieving the original level of consumption. The difference between these is therefore an approximation to the welfare change.

Note that we can combine equations (1), (2), (3) and (4) to write equation (6):

$$\frac{\Delta MMU}{Y} = \left(\sum_j BS_j^O \frac{\Delta p_j^O}{p_j^O} - \sum_k BS_k^I \frac{\Delta p_k^I}{p_k^I} \right) + \sum_f BS_f^W \frac{\Delta w_f}{w_f} + \frac{\sum_m \sum_n \Delta T_{mn}}{Y} - \sum_i BS_j^C \frac{\Delta p_j^C}{p_j^C}$$

[13] See Chen and Ravallion (2002) for an exposition of the theory.

where BS_j^O indicates the budget (or income) share of output revenue in total income, BS_j^I is the budget share of input costs, BS_j^W is the income share of net factor income from factor *f,* and BS_j^C is the budget share of good *j* in consumption. The first order percentage change in net income can approximate by the budget shares of income and expenditure on each item times the percentage changes in prices experienced.[14]

[14] See Minot and Goletti (2000) appendix 2 for a full derivation.

7. LIBERALIZATION OF AGRICULTURAL TRADE AND OLIGOPSONY: NEEDED POLICY RESPONSES FOR THE PADDY SECTOR IN SRI LANKA

7.1 INTRODUCTION

Importation of agricultural commodities in many countries is restricted through import tariffs and non-tariff barriers with a view of protecting primary producers. This phenomenon has created inefficiencies in resource allocation in national economies by increasing prices of agricultural commodities. Yet, countries continue to implement these policies assuming that markets are perfect and prices do transmit to primary producers. However, markets for many primary products are imperfect as they are characterized by exploitative middlemen, who could depress the prices of primary products. One such example is restriction of rice trade so as to protect paddy farmers in Sri Lanka.

The rice sector in Sri Lanka has been protected by successive governments through import restrictions, provision of various input subsidies, and government involvement in importation, procurement and distribution. Recently, the policy framework started to shift towards more liberal policies by reducing some trade restrictions and allowing the private sector to participate in importation, procurement and distribution of rice. Although liberalization of rice trade is encouraged by various donor agencies and trading agreements to acquire efficiency gains, it is opposed by various bodies highlighting its adverse impacts on paddy producers. Therefore, the Sri Lankan government has been somewhat reluctant to fully liberalize rice trade, even though it has taken steps to liberalize the procurement scheme.

Paddy production in Sri Lanka is mainly carried out by the small farmers. About 70% of the paddy farmers are having a land extent less than one hectare. These farmers relatively have a smaller bargaining power when compare with the buyers of paddy (Shihar, 2004), allowing buyers to depress the price of the product. The ability of buyers to depress price of the product subject to its supply curve, is known as oligopsony power. When there is an oligopsony power in the market, although it transmits price

whenever there is a shock, producers do not get the "right price" as in the case of a competitive market. It is always lower than the competitive price. Hence, liberalization of rice trade, which would lead to a decrease in prices of paddy, can have significant adverse impacts on the income from paddy farming.

The objective of this chapter is to assess the impact of rice trade liberalization on the paddy market in Sri Lanka, which is characterized by some degree of oligopsony power. Using a static simulation model in a partial equilibrium setting, this chapter shows how trade liberalization affects paddy prices in the presence and absence of oligopsony power. The chapter quantifies the adverse impacts of trade liberalization, that can be minimized if oligposony power can be eliminated.

The chapter is organized as follows. Next section shows some background information on the structure of paddy/rice market in Sri Lanka. Following section provides the methodology; conceptual model, algebraic model and data. Results are discussed next. Paper ends with conclusions and suggestions for further research.

7.2 STRUCTURE OF THE PADDY/RICE MARKET IN SRI LANKA

7.2.1 Government Involvement in Paddy Procurement

Noting the concern over higher bargaining power of the paddy buyers, successive governments in Sri Lanka intervened in paddy marketing through paddy procurement schemes associated with a guaranteed price. In 1971 the Paddy Marketing Board (PMB) was established with monopolistic rice trading powers within the country. The PMB was solely responsible for paddy procurement with cooperatives acting as its agents in buying paddy from farmers. The private sector was banned from procurement and marketing of paddy. The Food Commissioner's Department played its role as the import and distribution arm of the government. Although private businessmen were only allowed to carry-out milling, studies show that private trading was also operational during this period (Yoshimura et al., 1975). The role of the PMB was reduced to price stabilizing during bad seasons with the opening up of economy in 1977. Although PMB purchases were about 5% countrywide in the 1980s, its contribution in the main rice producing

districts was above 65% (Dharmaratne and Hathurusinghe, 1999). PMB closed down its operations in 1996 and its functions at present are conducted by the Co-operative Wholesale Establishment (CWE) to a certain extent. Private sector mainly conducts paddy marketing operations.

The Central Bank of Sri Lanka introduced a forward contract system in 1999 based on the concept of contractual marketing system between the sellers and the buyers. An award of US$240,900 was received from the World Bank for the promotion of the concept in April 2002. Only about 35,000 forward sales contracts have been signed between the parties during the first nine months (Central Bank, 2003) and majority of the farmers still sell their paddy in the open market.

7.2.2 Trade policy on paddy/rice

Up until 1988, rice was imported by the Food Department upon advise from the Ministry of Agriculture who decided the import requirement based on production forecasts of the year. The imported rice was distributed through multi purpose cooperative shops (MPCS), CWE and private wholesalers. The role played by the government through the Food Commissioner and the CWE as the sole importer of rice changed when the private sector companies were allowed to import rice since 1988. The importation of rice was based on licensing and a strict quota system which was decided according to the deficit of the domestic demand after considering the domestic production and food security concerns of the country. Rice importation was initially offered to three off-shore companies (Rassas and Fitch, 1991). These companies were allowed to import rice and store in the Food Department warehouses leased at commercial rates. Stocks were released to the market according to the requirement of the country and the duty was charged at the point of selling rice to the local market. Bondsmen were allowed to re-export rice without paying duty. There were 10 registered companies under the system by 1995 and only eight of these were active in the trade (Shilpi, 1995). According to the authors, bondsmen had little incentives to operate at the tariff and the conditions of operation in effect in 1995. By 1995, the government decided to liberalize rice imports. Licensing system was abolished and the tariff rate of 35% was in effect.

After 1995, this rate of tariff remained unchanged in principle but waivers were granted at different rates in specified periods to curtail increasing prices in the domestic market due to production shortages in the market. However, these duty waivers were not administered by the government vigilantly. Therefore, sudden increases of imports during short duty waiver periods were well evident. One such incidence is the reduction of tariff during the 4th quarter of 1999. It is observed that two third of the total quantity of rice imported during the year was under the duty reduction facility. The resultant decrease in prices of imported rice resulted in non-purchase of paddy by local millers causing difficulties to millers and paddy producers. At present, there is a specific import duty of Rs. 7.00 per kg on rice imports.

Paddy importation is banned in Sri Lanka. At present, paddy is one of the items under import licenses. Yet, both rice and paddy trade policy in Sri Lanka is well within the commitments of the World Trade Organization (WTO) as explained below.

WTO stipulates conversion of non-tariff barriers (NTB) into tariff barriers and reduction in tariffs. Sri Lanka has bound around 99% of the tariff lines of the agricultural products at 50% with the WTO. However, at present, applied tariff rates of many items are as low as 25%, 10% and 2% except for a very few items. Specific duties have been introduced to some sensitive products including rice recently to protect domestic farmers.

Sri Lanka identified about 75% to 50% of tariff lines which are covered under the Agreement on Agriculture (AoA) of WTO, as 'import-sensitive' tariff lines and within that category some products, as 'special products' based on whether they affect food security, rural development and or livelihood security concerns. Paddy and rice may be included here as rice is the staple food in Sri Lanka. No tariff reduction commitments are applied for those products in their schedules of commitments. Rate of reduction (tariff cut) for import-sensitive items are lower than those for the balance items.

At present, Sri Lanka does not have license control for agriculture items other than for plant quarantine purposes. However, in some instances in the past, (July 2000) licensing was imposed temporarily to control falling domestic paddy prices due to the

bumper paddy harvests. As stated earlier, later this licensing requirement was abolished and rice was subjected to a specific duty. Even though AoA requires all non-tariff barriers to be converted into tariff barriers and import licensing schemes could also be actionable policies, such market access provisions do not apply when the commodity in question is a traditional staple of a developing country. As a result, in Sri Lanka, the import licensing scheme on rice can be exempted.

In the world market, AoA was not expected to result in significant changes in world production of rice but the volume of trade was expected to rise by 5%, largely because of the market access commitments by Japan and the Republic of Korea (FAO, 1999). Hence, the impact of AoA commitments on rice markets in Sri Lanka mainly depends on the commitments made by Sri Lanka. As shown earlier, Sri Lanka has already eliminated the import-licensing scheme, and the only commitment will be to reduce tariff. It is expected that rice will be included as a special product under the import-sensitive category, for which tariff reductions are not applicable or minimal.

7.2.3 Imperfections in paddy/rice market

Existing literature does not provide conclusive evidence regarding the imperfections in the paddy market in Sri Lanka. According to Rupasena (2002), the major reason attributed to low farm prices is that buyers are not competing with each other in pricing and they are offering low prices and competitiveness has been curtailed due to the prevalence of only few traders. Furthermore, there is evidence to say that free entry of paddy collectors from other areas to certain paddy producing areas is blocked by exploitative paddy collectors in the area, leading paddy producers with only few choices.

Even though many argue that the interface between paddy producers and paddy collectors has not been competitive, some believe that Sri Lanka had a competitive rice processing sector (Harrison, 1995). This assessment was arrived by focusing on the number of rice millers in the industry, which was considerable during the period under

consideration[15]. Wicramasinghe (1999) and Ubaldulah (1999) observe that the rice-milling industry has experienced a decline in number of millers during 1997 as a result of rice-trade liberalization. More than 100 mills stopped operations and about 20 large-scale mills continued operations in Polonnaruwa area during this period showing the inability of small millers to survive (Wicramasinghe, 1999).

According to Ellis et al. (1997), paddy market is efficient as evident by the paddy marketing margins, which are stable over the years, particularly when the PMB was at its minimal operation. The authors hence recommended privatization of marketing activities so as to achieve efficiency gains. However, one should note that the degree of market power is determined by the ability of one party to change the market price. A market could have stable margins over a length of time despite the presence of unequal bargaining power.

7.2.4 Needed policy responses for the paddy/rice sector

As described earlier, in order to correct the market failure due to oligopsony power of paddy buyers, government earlier introduced a price support cum a procurement scheme through PMB. PMB was not successful due to inefficiency of government officials, bribery and corruption being the roots of inefficiency. As a result, government procurement scheme was privatized. While some are with the view that it is a right direction in policy and Sri Lanka should allow markets to determine prices as PMB was not successful, others with the view that government intervention in procurement is necessary as middlemen exploit the paddy producers. Some others view that a government owned, privately managed institution is necessary to moderate paddy marketing.

[15] It should be noted that the number of firms in an industry is a weak indicator of market power, and the strategic reactions among the firms determine the degree of market power. An industry with a large number of firms may exercise monopoly and monopsony power if all the firms decide to collude. In contrast, an industry with a small number of firms may act as a competitive industry, if there is price competition among firms.

Paddy farmers are always of the opinion that the government must purchase their total marketable surplus, and even the PMB had some success though limited. Batuwitage (1999) indicates that paddy purchasing by PMB should be continued in order to overcome some of the problems in marketing. However, Dharmaratne and Hathurusinghe (1999) indicate that small farmers faced many problems when they tried to sell paddy to the PMB and hence it is not a viable strategy. Kodithuwakku (2003) suggests that the problems associated with the PMB were due to poor management and it does not indicate that government involvement is always unsuccessful. Government should play an active role in paddy marketing together with private sector.

As stated earlier, rice trade was liberalized to a certain extent in the recent past to acquire efficiency gains from liberalization. The studies evaluated the efficiency gains (Rafeek and Samarathunge, 2000 and Weerahewa, 2003) highlight the adverse impacts of rice trade liberalization on paddy producers which are quite significant when consider the presence of exploitative middlemen. To author's knowledge, no studies have been conducted so far to evaluate the impacts of rice trade liberalization incorporating the oligopsony power of middlemen in Sri Lanka. The following section presents a market model under oligopsony which could quantify the gains with the elimination of market power if at all it is possible, and capture the impacts of liberalization of rice trade.

7.3 METHODOLOGY

7.3.1 Conceptual Model

A partial equilibrium model under imperfect competition considering perfect competition and monopsony as special cases was developed for the paddy market (Figure 13). In this model, the demand function is a derived demand function of paddy buyers (D). The supply function is the farm-gate supply of paddy by the primary producers (S). The market clears when paddy demand is equal to paddy supply as paddy imports are banned. When the market is perfectly competitive, equilibrium price is determined when the demand curve intersects with the supply curve (A). When the market is a monopsony, equilibrium quantity is determined when the demand curve intersects with the marginal

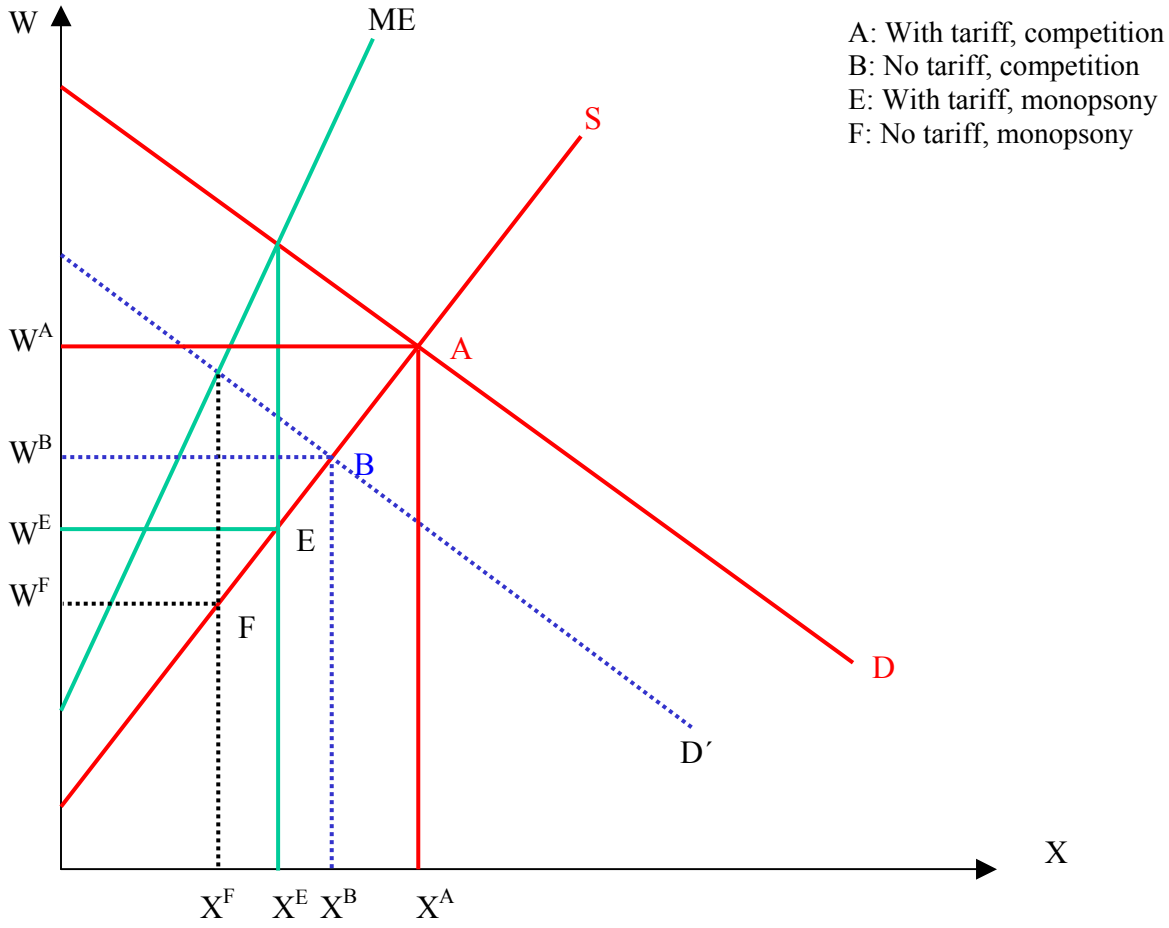
expenditure (*ME*) curve and equilibrium price is determined when the equilibrium quantity intersects with the supply curve (*E*).

Figure 13 shows the equilibrium of the paddy market before and after trade liberalization under perfect competition and monopsony. Equilibrium quantity and price in the perfectly competitive market are given by X^A and W^A respectively and equilibrium quantity and price in the monopsony market are given by X^E and W^E respectively before trade liberalization. As trade liberalization leads to a drop in rice price, demand for paddy shifts to the left as an effect of trade liberalization. Equilibrium quantity and price in the perfectly competitive market are given by X^B and W^B respectively and equilibrium quantity and price in the monopsony market are given by X^F and W^F respectively after trade liberalization. As shown in figure 13, the direction of the impacts of trade liberalization on paddy prices and quantities, which are negative, does not depend on the structure of the market, *i.e.,* whether it is perfectly competitive or monopsony.

The present situation of the Sri Lankan paddy market is close to a situation depicted by the equilibrium *E*. The rice market is protected by a tariff barrier and monopsony power exits and hence, equilibrium quantity and price in the market are given by X^E and W^E respectively. If trade is liberalized together with a reform to eliminate market power, the market will move to the equilibrium *B*. The equilibrium quantity and price in the market will be given by X^B and W^B respectively, indicating an increase in price and quantity due to the policy reform. Hence, it is clear that depending upon the slope and position of demand and supply curves and the size of trade liberalization shock, it is possible to have positive impacts due to trade liberalization if it is coupled with market reforms to eliminate monopsony power.

As stated earlier, figure 13 only shows two extreme cases as the structure of the market, *i.e.,* perfect competition and monopsony. In reality, the equilibrium of the market can lie at any point between the perfect competition and monopsony, *i.e.,* oligopsony. This can be captured by including conjectural variation elasticity in the derived demand function, as described in the following section.

Figure 13—Equilibrium in the Paddy Market before and after Tariff Liberalization with and Without Oligopsony Power



7.3.2 Algebraic Model

Suppose that paddy processors (collectors/millers) are competitive in the output market and they possess oligopsony power in the input market[16]. Oligopsony power in the input market can be captured by the conjectural variation approach, which considers the strategic interactions among the firms. Conjectural variation approach to measure market power considers that firms simultaneously and independently choose input levels

[16] Output market is treated to be competitive as it is open to world market subject to an import tariff. Note that when the output market is competitive, middlemen cannot exert oligopoly power over the final consumers even though they can exert oligopsony power over the primary producers.

given their beliefs about their rival's reactions to their choice. Following Azzam and Pagoulatos (1990), model given below was developed to capture the oligopsony power.

Suppose that the objective of the j^{th} paddy processor is to maximize profit π_J:

$$Max\,\pi_j = P \cdot q_j - W \cdot x_j \tag{1}$$

Subject to,

$$q_j = q_j(x_j) \tag{2}$$

$$X = \sum_{j=1}^{n} x_j \tag{3}$$

$$W = W(X, Zs) \tag{4}$$

Where P is price of rice, q_j is quantity of rice produced by the j^{th} firm, W is price of paddy, x_j is quantity of paddy demanded by the j^{th} firm, X is the industry supply of paddy and Zs is exogenous factors affecting paddy supply. Equation (2) presents the production function of the j^{th} firm, equation (3) presents the industry demand for paddy considering that there are n number of firms in the industry, and equation (4) shows the industry supply of paddy. The first order conditions of the above problem is,

$$\frac{\partial \pi_j}{\partial x_j} = P \cdot \frac{\partial q_j}{\partial x_j} - \frac{\partial W}{\partial X} \cdot \frac{\partial X}{\partial x_j} \cdot x_j - W = 0 \tag{5}$$

Equation (5) can be rearranged to obtain,

$$P \cdot MP_j = \frac{\partial W}{\partial X} \cdot \frac{X}{W} \cdot \frac{\partial X}{\partial x_j} \cdot \frac{x_j}{X} \cdot W + W \tag{6}$$

Equation (6) can be simplified to write,

$$P \cdot MP_j = \left(\frac{\theta}{\varepsilon} + 1 \right) \cdot W \tag{7}$$

where $\theta = \frac{\partial X}{\partial x_j} \cdot \frac{x_j}{X}$ is the conjectural variation elasticity and it shows the ability of the j^{th} firm to influence the total quantity demanded by the industry. ε is the supply elasticity of

paddy with respect to paddy price. When market is perfectly competitive $\theta = 0$ as $\frac{\partial X}{\partial x_j} = 0$ by definition. When $\theta = 1$, market is monopsony and for all the other values, $0<\theta<1$ it shows an oligopsony. The market power of the processor is given by the Learner Index θ/ε. The higher the θ and the lower the ε are, the higher the market power is. Let

$$Wd = W \cdot \left(\frac{\theta}{\varepsilon} + 1 \right) \tag{8}$$

MP_j, marginal product of paddy, is a function of x_j for a well behaved production function. Hence demand for x_j can be written as,

$$x_j = x_j(P, Wd, zd) \tag{9}$$

Where *zd* is a vector of other factors affecting demand. Assuming aggregation conditions hold, demand for *X* by the industry is given by,

$$X = f(P, Wd, Zd) \tag{10}$$

where, $X = \sum_{j=1}^{n} x_j$ equilibrium in the input market is given by the equations (4), (8), and (10). The exogenous policy variable in the system are *P, Zd and Zs,* and endogenous variables are *Wd*, *X* and *W*.

7.4 DATA

The above model was calibrated for the paddy market in Sri Lanka using the quantities and prices in 2001. Quantity of paddy supplied and demanded was considered as 2,700,000 Mt and prices of paddy and rice were considered as 12.00 Rs/kg and 32.50 Rs/kg respectively (Central Bank of Sri Lanka, 2001). A range of elasticity values for supply and demand was used; *i.e.* |0.5|, |1.0|, and |1.5| were chosen to show inelastic, unitary elastic and elastic supply and demand functions respectively. Similarly, a range of conjectural variation elasticity values was used in the sensitivity analysis; *i.e.* 0.0, 0.5 and 1.0 were chosen to show perfect competition, ologopsony and monopsony respectively. Value of the endogenous variable, *Wd,* was generated under different scenarios using above data.

7.5 SIMULATION RESULTS

Three policy experiments were conducted: trade liberalization, elimination of market power and trade liberalization along with elimination of market power. Trade liberalization was modeled by reducing the retail price of rice by 30%. Elimination of market power was modeled by setting conjectural variation elasticity to zero. Impacts were assessed under different assumptions regarding the elasticity values of demand and supply.

As expected, results show that rice trade liberalization has negative impacts on paddy production and paddy prices. Regardless of the degree of oligopsony power and price elasticities, a drop in price of rice by 30% decreases paddy price from 12.00 to 10.20, which a drop by 15%. Depending upon the elasticity values considered, paddy production could drop by 7.5 to 15%.

Table 32—Impacts of Trade Liberalization on the Paddy Market

Elasticity	**Market Structure**	No Market Power		**Trade Liberalization and No Market Power**	
		Price	Quantity	Price	Quantity
	Baseline values	12.00	2700.00	12.00	2700.00
Elastic	Oligopsony	13.71	3278.57	11.66	2504.28
| 1.5 |		(14.28)	(21.42)	(-2.86)	(-4.29)
	Monopsony	15.00	3712.50	12.75	2953.12
		(25.00)	(37.50)	(6.25)	(9.38)
Unitary elastic	Oligopsony	14.40	3240.00	12.24	2754.00
| 1.0 |		(20.00)	(20.00)	(2.00)	(2.00)
	Monopsony	16.00	3600.00	13.6	3060.00
		(33.00)	(33.00)	(13.00)	(13.00)
Inelastic	Oligopsony	16.00	3150.00	13.60	2880.00
| 0.5 |		(33.33)	(16.67)	(13.33)	(6.67)
	Monopsony	18.00	3375.00	15.30	3071.25
		(50.00)	(25.00)	(27.5)	(13.75)

Numbers in parenthesis are percentage change from the baseline equilibrium.

Also results show that elimination of market power has positive impacts on prices and quantities under all scenarios. When the supply is inelastic, degree of oligopsony power is high, so that impacts due to elimination of oligopsony power too is high. Table 32 shows the impacts under various scenarios. If the demand and supply functions are elastic and conjectural variation elasticity is 0.5 (oligopsony), elimination of oligopsony power could increase paddy price from Rs.12.00 to Rs. 13.71 which is an increase by 14.28%. If they are inelastic and conjectural elasticity is 1.0 (monopsony), the impact on price could be as high as 50%.

Simultaneous liberalization of trade and elimination of market power have uncertain impacts on paddy production and prices. The sign of the impacts depend on the elasticities of supply and demand and the structure of the market. If the degree of market power is relatively small, *i.e.,* when conjectural variation is 0.5 (oligopsony), trade liberalization has negative impacts on production and prices, despite elimination of oligopsony power. When the conjectural variation elasticity is close to 1.0 (close to monopsony), there is a certain positive impact of trade liberalization on production and price if oligopsony power can be eliminated. Furthermore, the sign of the impact also depend on the elasticities of supply and demand. If the supply elasticity value is inelastic, liberalization of trade along with reforms to eliminate market power leads to higher gains, as the baseline equilibrium is characterized by high oligopsony power. Many authors have found that supply elasticity with respect to own price is inelastic for paddy in Sri Lanka (Niranjan et al., 2000 and Weerahewa, 2003), and hence latter scenario represents the reality to a larger degree.

7.6 SUMMARY AND CONCLUSIONS

Liberalization of agricultural trade in many countries may continue to acquire efficiency gains as suggested by various trade agreements and donor agencies. Policy makers are concerned about the adverse impact of agricultural trade liberalization on primary producers as they are already exploited by the middlemen. This study analyzes the impacts of rice trade liberalization on paddy market in Sri Lanka which is

characterized by some degree of oligopsony power. Results of the analysis show that losses to the paddy producers due to trade liberalization can be considerably minimized if oligoposony power can be eliminated simultaneously. Further research is necessary to reveal the degree of oligopsony power, which would be required to assess the size of losses due to oligopsony power.

The study recommends rice trade liberalization to acquire efficiency gains together with market reforms to eliminate market power exercised by middlemen. One of such market reforms is government procurement with a price support scheme to maintain competitive paddy prices. If such a reform is chosen, levels of price support should be adjusted to reflect the changes in the market due to policy regime (trade liberalization) or natural factors (bumper harvest) in order to minimize efficiency losses arisen due to price support scheme. For example, if trade is liberalized, support price should also be reduced. Otherwise it will have adverse impacts on the milling sector. If there is a bumper crop, lowering of support price will be necessary, which may lead to lowering of rice prices as well. Reforms to increase the bargaining power of paddy producers should also be seriously considered to correct market failure due to exploitative middlemen. They may include provision of credit and storage facilities to farmers and strengthening of farmer organizations.

8. SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The impacts of trade liberalization and market reforms are case specific. Some countries have achieved food security through trade liberalization and reforming markets through deregulation, while others have not. The rice sector in Sri Lanka has been protected by successive governments through the provision of various input subsidies, government involvement in importation, procurement and distribution, and import restrictions. Recently, the policy framework started to shift towards more liberal policies, by allowing the private sector to participate in importation, procurement and distribution of rice. However, rice trade has been restricted as policy markers view that trade liberalization may have adverse impacts on poverty.

Given this background, the overall objective of this study is to assess the impacts of different types of policies on the status of food security with special emphasis on paddy/rice sector in Sri Lanka. The specific objectives are:

(a) To describe the present status of paddy production, procurement and distribution system in Sri Lanka, paying special attention to the involvement of government agencies and private sector.

(b) To document the evolution of domestic and trade policies affecting the above system showing the extent of liberalization over time.

(c) To examine Sri Lanka's position on the Agreement on Agriculture in the WTO and its likely impact on paddy/rice sector.

(d) To investigate the impact of rice trade liberalization and privatization of paddy procurement system on prices, supply of paddy, demand for rice, imports of rice and calorie intake at the national level.

(e) To investigate the impact of rice trade liberalization at the household level, and for various groups in the population, with a view to understand the implications for poverty.

(f) To investigate the likely impacts of elimination of oligopsony power of the paddy collectors on the well being of paddy farmers.

The analysis of the marketing channels for paddy/rice indicates that they are mainly performed by the private sector. State involvement in procurement, storage and distribution has been minimal. Import restrictions on rice have been very ad-hoc, imposing restrictions during glut seasons and relaxing them during rice shortage periods. The analysis of the commitments with WTO shows that Sri Lanka did not have to liberalize the rice market due to WTO commitments as negotiated at the Uruguay Round. Trade restrictions and domestic support provisions at present are well within WTO rules. The attempts made so far to liberalize the rice market are unilateral, in order to obtain efficiency gains.

The impacts of rice trade liberalization and privatization of government procurement program were simulated using an econometrically estimated partial equilibrium model. Results reveal that with the drop in retail prices due to trade liberalization, calorie intake will be increased and hence trade liberalization can be used as a possible strategy to increase food security. Yet, it depresses producer prices, which would reduce the income of the paddy producers. Such a reduction in incomes will lower the capacity of the farming community to purchase food, and it may offset some of the gains of the net consumers of food. Furthermore, due to a drop in prices, inefficient high cost producers will leave the industry. In Sri Lanka, paddy farmers with smallholdings are the inefficient farmers. Therefore such an exit may have serious repercussions on poverty. Also, the results show that by reforming the market so as to allow only the private sector to purchase paddy, producer price will be further depressed. Such a policy can clearly reduce the status of food security of the farming community.

At present, legal framework in the country does not allow conversion of paddy lands into non-paddy lands. Furthermore, when paddy lands are converted into other land uses water-logging conditions can be arisen in the wet zone areas. As a result, lands that are released from paddy cultivation may not be demanded by the other sectors. Therefore, there will be adverse impacts of rice trade liberalization on paddy landowners also. The model treats wage rate as exogenous, as the wage rate is considered to be determined by the supply and demand conditions in the non-farm sector. If the wage rate adjusts to the changes in the rice market, then there will be adverse impacts of rice trade liberalization on the labor force as well.

Since the above mentioned results indicate adverse impacts farming community, which considers to be poor, poverty impacts of trade liberalization were examined for different groups of people in the country. Results suggest that there is a net gain to all the income groups, provinces and sectors due to trade liberalization. The biggest gainers are the very poor (defined here as those who earn an income Rs. 791.67 per person per month), the North-western province and the estate sector, where the poverty incidences are found to be the highest. Paddy farmers with relatively bigger holdings (defined here as greater than 0.217 acres and less than 2 acres) are found to be negatively affected. It appears from the results that rice trade liberalization is a pro-poor policy. However, the losses to the net producers of paddy were not fully incorporated in the analysis due to unavailability of data. Also, the analysis assumed that quantities do not adjust due to price changes and results only show the impacts in the short run. Further analysis is necessary to reveal medium- and long-term impacts.

Next, elimination of oligopsony power of middlemen was assessed as one of the strategies to mitigate the adverse impacts of rice trade liberalization on the farming community. The impacts of rice trade liberalization along with elimination of oligoposony power were simulated under a partial equilibrium setting. Results reveal that losses to the paddy producers due to trade liberalization can be minimized if oligoposony power can be eliminated simultaneously. Further research is necessary to

reveal the degree of oligopsony power, which would be required to assess the size of losses due to oligopsony power.

In general, while the study supports rice trade liberalization to acquire efficiency gains, it is recommended that it to be implemented together with market reforms to eliminate market power exercised by middlemen and/or with mechanisms to increase the bargaining power of the farmers. Market reforms to eliminate oligopsony power could be conducted by increasing government procurements and having price support schemes to maintain competitive paddy prices. It should however be noted that the Doha negotiations are mainly focused on the behind-the-border reforms, and price support programs may not be allowed. Commitments with Doha should be carefully examined and negotiated in order to develop policies to improve the rice sector in Sri Lanka. Liberalization of land market, provision of credit and storage facilities, strengthening of farmer organizations are some of the strategies to improve the bargaining power of the farmers.

Future research in this area needs to focus on the following areas: (i) assessing the ways and means of strengthening the small farmers from the exploitative traders, (ii) evaluating "land consolidation" as a measure of increasing bargaining power of the small farmers, (iii) assessing the role of farmer organizations, and (iv) evaluating contract farming as a viable strategy.

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