



UNIVERSITI PUTRA MALAYSIA

**AN ECONOMIC ANALYSIS OF CONSUMER DEMAND
FOR RICE IN SRI LANKA**

RUPASENA LIYANAPATHIRANA

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FOR RICE IN SRI LANKA**

By

RUPASENA LIYANAPATHIRANA

**A thesis submitted in partial fulfilment of the
requirements for the degree of Master of Science
in the Faculty of Economics and Management
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RUPASENA LIYANAPATHIRANA

March, 1989

Supervisors : Mr. Zainal Abidin Tambi
: Dr. Zainal Abidin Mohamed
Faculty : Economics and Management

The objective of this study is to investigate the consumer behavior of demand for rice in Sri Lanka. To achieve this objective a demand model for the rice sector is developed. The model consists of an open market consumption equation, an open market price equation, an import equation, a domestic supply equation and an identity for government stock. The Two Stage Least Squares technique is used to estimate the model using time series data from 1955 to 1985. All estimated parameters in the model are consistent with postulated behavior and theoretical expectations.

The estimated parameters of the econometric model suggest that real income and government intervention in rice distribution are major determinants of rice consumption in the



open market. The elasticity of demand for the open market rice with respect to quantity of rice distributed by the government is -0.77, indicating that one percent decrease in the quantity of rice consumed under government rice distribution programme results in 0.77 percent increase of rice consumption in the open market. Similarly, an increase of one percent income will increase consumption of rice in the open market by 0.63 percent. However, the price of rice does not play an important role in determining its quantity consumed; one percent rise in price is likely to result only in 0.33 percent decline in rice consumption in the market. Also, increase in price of wheat flour does not have considerable impact on increase in rice consumption because they are not close substitutes.

In conclusion, the increase in income of the rice consumers especially low-income people appears to be the most appropriate policy instrument to increase the domestic rice consumption.

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oleh

RUPASENA LIYANAPATHIRANA

Mac 1989

Penyelia : Encik Zainal Abidin Tambi
: Dr. Zainal Abidin Mohamed
Fakulti : Ekonomi dan Pengurusan

Objektif kajian ini ialah untuk menyelidik tingkahlaku pengguna terhadap permintaan untuk padi di Sri Lanka. Untuk mencapai objektif tersebut satu model permintaan padi telah di sediakan. Model ini mengandungi persamaan permintaan pasaran terbuka, persamaan harga pasaran terbuka, persamaan import, persamaan penawaran tempatan dan persamaan identiti untuk stok kerajaan. Teknik kuasa dua terkecil dua peringkat digunakan untuk menganggarkan model ini dengan menggunakan data siri masa dari tahun 1955 ke tahun 1985. Setiap Anggaran Parameter di dalam model ini selaras dengan tingkahlaku dalil dan segala jangkaan yang berdasarkan teori. Anggaran Parameter model econometrik mencadangkan bahawa pendapatan benar dan campurtangan kerajaan dalam pengagihan padi merupakan penentu

utama dalam penggunaan padi di dalam pasar terbuka. Keanjalan permintaan padi di pasar terbuka jika dibandingkan dengan quantiti padi yang diagih oleh kerajaan ialah -0.77 , yang bermaksud bahawa pengurangan satu peratus di dalam quantiti penggunaan padi yang diagih oleh kerajaan akan menambahkan 0.77 peratus penggunaan padi di pasar terbuka.

Seterusnya, tambahan satu peratus di dalam pendapatan akan menambahkan penggunaan padi di dalam pasar terbuka dengan 0.63 peratus. Walaubagaimanapun harga padi tidak memainkan peranan yang penting dalam menentukan penggunaan padi; tambahan satu peratus di dalam harga padi akan hanya mengakibatkan kekurangan 0.33 peratus penggunaan padi di dalam pasar terbuka. Selain daripada ini tambahan dalam harga tepung gandum juga tidak akan membawa kesan yang ternyata terhadap tambahan dalam penggunaan padi kerana mereka tidak merupakan hasil tanaman yang dapat ditukar ganti untuk penggunaan.

Secara kesimpulan ternyata bahawa tambahan pendapatan pengguna padi terutamanya di kalangan pengguna di strata pendapatan rendah merupakan sesuatu alat polisi yang paling sesuai untuk menambahkan penggunaan padi tempatan.

CHAPTER 1

INTRODUCTION

The Role of Rice in Sri Lanka's Economy

Rice is the major staple food for all Sri Lankans. The annual per capita consumption of rice is about 100 kilogrammes (kg) which represents 75 percent of the total grain consumption. Some 45 percent of the total calories is derived from rice. It is the most significant item of food expenditure in the household budget. The average person spends about 28 percent of his total expenditure on rice which is approximately one-fifth of his income. About 75 percent of the "food stamp" income is also used to purchase rice (Edirisinghe, 1986: 11, Sirisena, 1986: 86).

In 1986, paddy production (unmilled rice) contributed 6 percent to the gross national product (GNP), more than any other crop. Rice cultivation occupies one-fifth of the arable land and provides employment for about 22 percent of the workforce of the country. The rice sector has been responsible for a large proportion of employment growth. Some 30 percent of the total increase in employment between 1946-1960 was attributed to rice production. More than 75 percent of the rice farmers are from the rural population and about 56 percent of their total income is derived from rice cultivation.

Rice Supply Sources

¹
Before the colonial era, the island had been self-sufficient in rice (Karunaratne, 1982: 86). At that time a prime objective of the political leadership and agricultural policy therefore focused on development of the rice economy. However, this relationship did not persist in the colonial era because colonial rulers followed commercial oriented agricultural policy. The trend of development during the colonial era, especially the British period, had emphasized on the plantation sector which was concerned with exportable commodities such as coffee, tea, rubber and coconut. This severely affected the domestic rice economy which was essentially subsistence in nature. Consequently, rice imports became necessary as the domestic rice production was insufficient to meet the local demand.

Domestic Rice Supply

There are two major rice growing seasons called "Maha" and "Yala". The Maha is the main season contributing about 75 percent to the total annual paddy production. The Maha crop of

1

The Portuguese occupied the maritime areas of the country in 1505. They were succeeded by the Dutch in 1656. The British came into power in the maritime provinces by defeating the Dutch in 1796. They extended political power over the whole country in 1815. Sri Lanka obtained independence from the British in 1948.

paddy is planted during the period of September to November and harvested between January and March. The Yala paddy cultivation begins in April and harvesting takes place up to the month of August. Double cropping of rice is practised in areas where irrigation facilities are adequate.

Rice farming is mainly handled by small farmers. According to the census of Agriculture 1982, some 42 percent of all holdings is less than one acre. Although paddy is grown throughout the country but only 5 districts out of a total of 25 are prominent, accounting for about 75 percent of the national production (Figure 1).

Successive governments since independence have given priority in their development programmes to develop the rice sector by increasing acreage and productivity of holdings. As a result, domestic supply of rice increased from 424 thousand metric tons in 1955 to 1659 thousand metric tons in 1985 (Table 1). According to trend estimate (Appendix A, equation 1), this represents an annual rate of increase of 4.8 percent. However, the growth was not uniform over time (Figure 2). The periods² between 1956–1960, 1966–1970 and between 1978–1985 showed a fairly rapid growth in production, indicating 15, 9 and 8 percent annual increase, respectively. The period of

2

Since government policy is a major determinant of paddy production the whole time period is divided into sub-periods based on political changes.

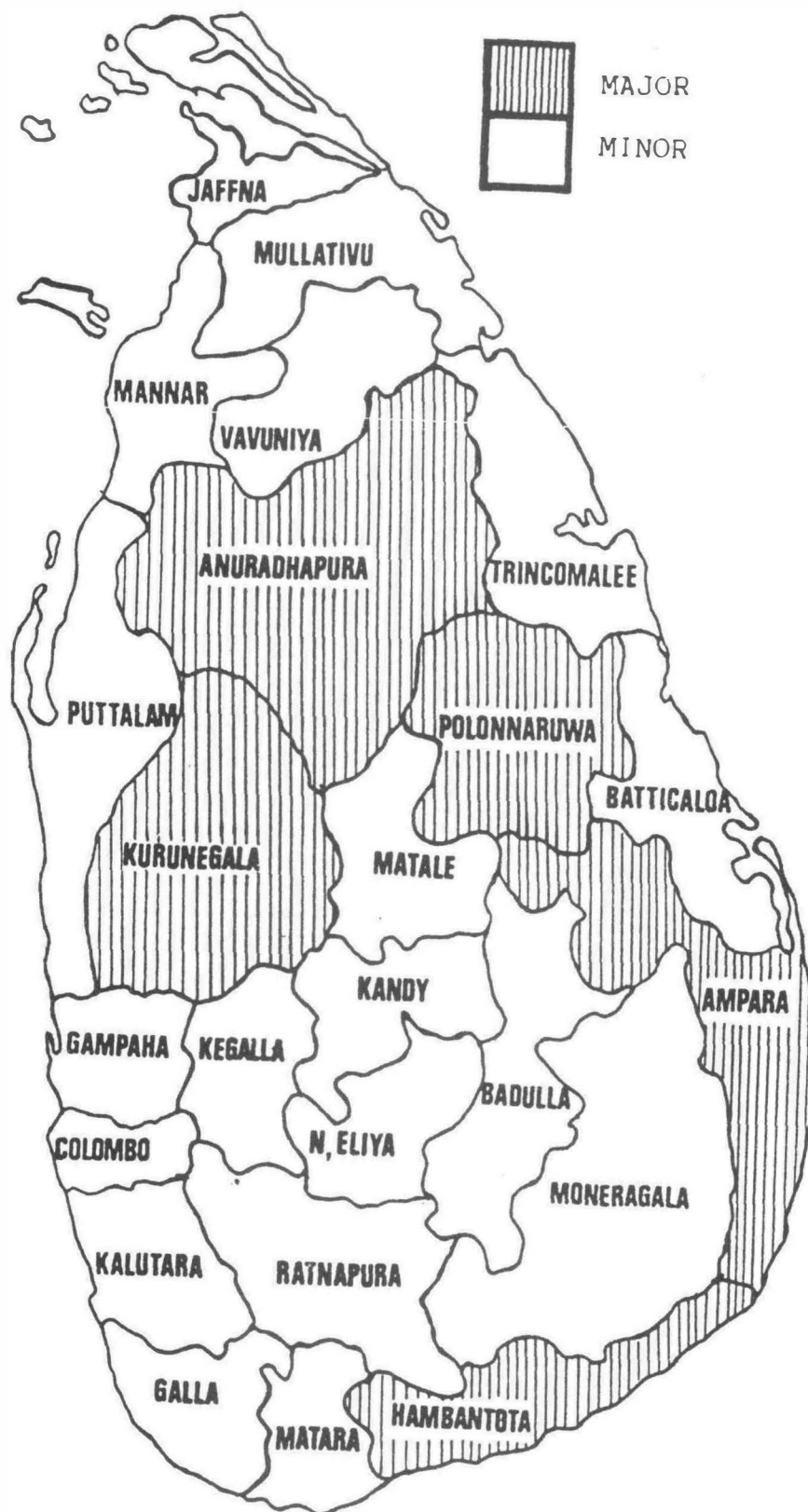


Figure 1
Paddy Producing Districts, Sri Lanka, 1955-1985

Table 1

Rice Supply, Sri Lanka, 1955-1985 (Thousand metric tons)

Year	Domestic Supply	Imports	Total Supply	Percent Domestic Production to Total Supply
1955	423.91	387.41	811.32	47.75
1956	318.16	491.32	809.48	39.30
1957	375.14	522.91	898.05	41.77
1958	447.29	482.24	929.53	48.12
1959	446.85	583.15	1030.00	43.38
1960	523.82	528.13	1051.95	49.80
1961	545.41	504.53	1049.94	51.95
1962	611.78	523.22	1135.00	53.90
1963	621.34	559.54	1180.88	52.62
1964	639.14	555.58	1194.72	53.50
1965	443.73	652.01	1095.01	40.50
1966	577.70	492.35	1070.05	53.98
1967	692.53	380.72	1073.25	64.53
1968	819.64	349.34	1168.98	70.12
1969	830.19	264.36	1094.55	75.85
1970	989.35	534.04	1523.39	64.94
1971	843.30	339.20	1182.50	71.31
1972	786.73	282.79	1069.52	73.56
1973	786.83	343.13	1129.96	69.63
1974	965.70	301.83	1267.53	76.19
1975	687.03	459.32	1146.35	59.93
1976	748.27	425.06	1173.33	63.77
1977	1025.47	542.48	1567.95	65.40
1978	1159.88	186.76	1346.64	86.13
1979	1179.73	211.53	1391.26	84.80
1980	1318.81	128.85	1447.66	91.20
1981	1378.68	157.03	1535.71	89.77
1982	1333.31	160.93	1494.24	89.23
1983	1546.57	123.17	1669.74	92.62
1984	1493.57	202.49	1696.06	88.06
1985	1658.64	182.30	1840.94	90.10

Source: Department of Census and Statistics, Sri Lanka

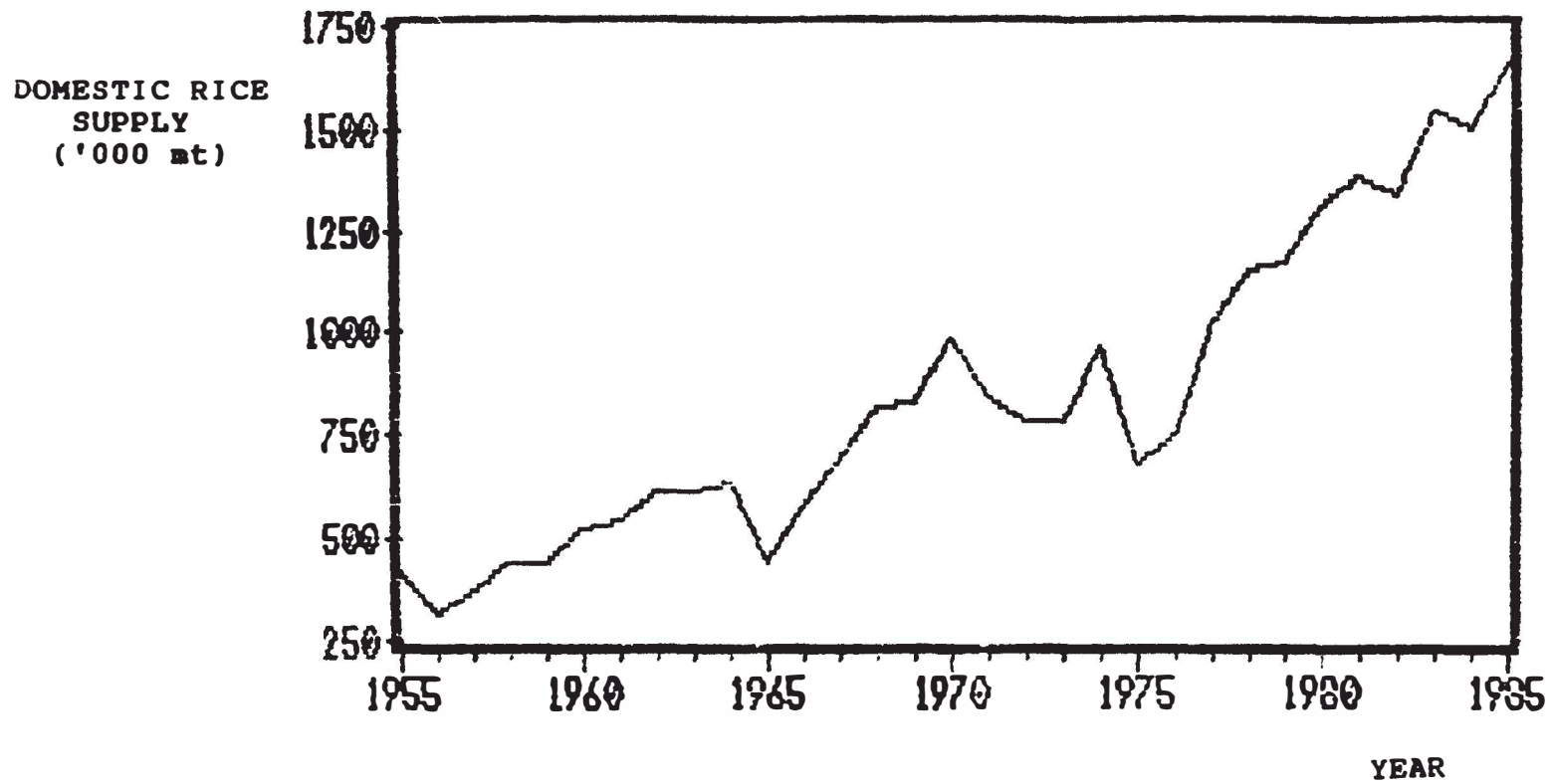


Figure 2

Domestic Rice Supply, Sri Lanka, 1955-1985

economic policy implemented during the later period did not help increase the paddy production. Tight economic policy contributed to the lower application of fertilizer resulting from limited supplies due to import restrictions. The rigid monopolistic behaviour of the Paddy Marketing Board (PMB) also became a major constraint to the development of the paddy sector during the period of 1970–1977. The government banned sales of paddy to the private sector and farmers were required to sell to the PMB at the guaranteed price. This regulation generated hardship for many farmers; paddy had to be transported to the PMB purchasing centre, payments were in cheque and often delayed, and paddy grades and standards were often not accurate.

Rice Imports

As mentioned earlier, the history of rice imports dates back to the colonial era. Colonial rulers, especially the British, imported rice mainly to feed the migrant labour force employed in the plantation sector. During the period of 1871–1900 migration accounted for over half of the increase in population. As a result, per capita rice imports increased from 35 kilogrammes in 1840 to 73 kilogrammes in 1901 or by 109 percent (Edirisinghe and Pollamand, 1976: 5–7).

After independence, rice was imported for the requirement of rice rationing scheme (this programme will be discussed in

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After independence, rice was imported for the requirement of rice rationing scheme (this programme will be discussed in



page 13). Therefore, the fluctuation of rice imports (Figure 3) linked with the change in this programme (Table 2 in page 11). For instance, rice imports declined considerably during the period of 1966-1970 because quantity distributed under the ration was reduced by 50 percent. The government agricultural policy aimed at attaining self-sufficiency in rice also affected declining rice import during the period concerned.

Rice Distribution

The marketing system for rice in Sri Lanka can be categorized into two groups; private marketing system and government marketing system. Figure 4 shows that both groups operate at all three levels; primary, wholesale and retail in the marketing chain.

The collectors are the main buyers at the farm level in the private marketing system. They purchase paddy from the farmers and sell it to the millers usually at the collecting centers. The millers sell milled rice to the wholesalers who in turn sell it to retailers. Since 1977 the private marketing system has been playing a dominant role in the rice market (ARTI, 1987: 15, Somaratne, 1987: 9).

Successive governments of Sri Lanka since the Second World War have been directly involved in the marketing of rice. Paddy purchasing under the guaranteed price scheme was handled by the Department of Agrarian Service until 1971. The



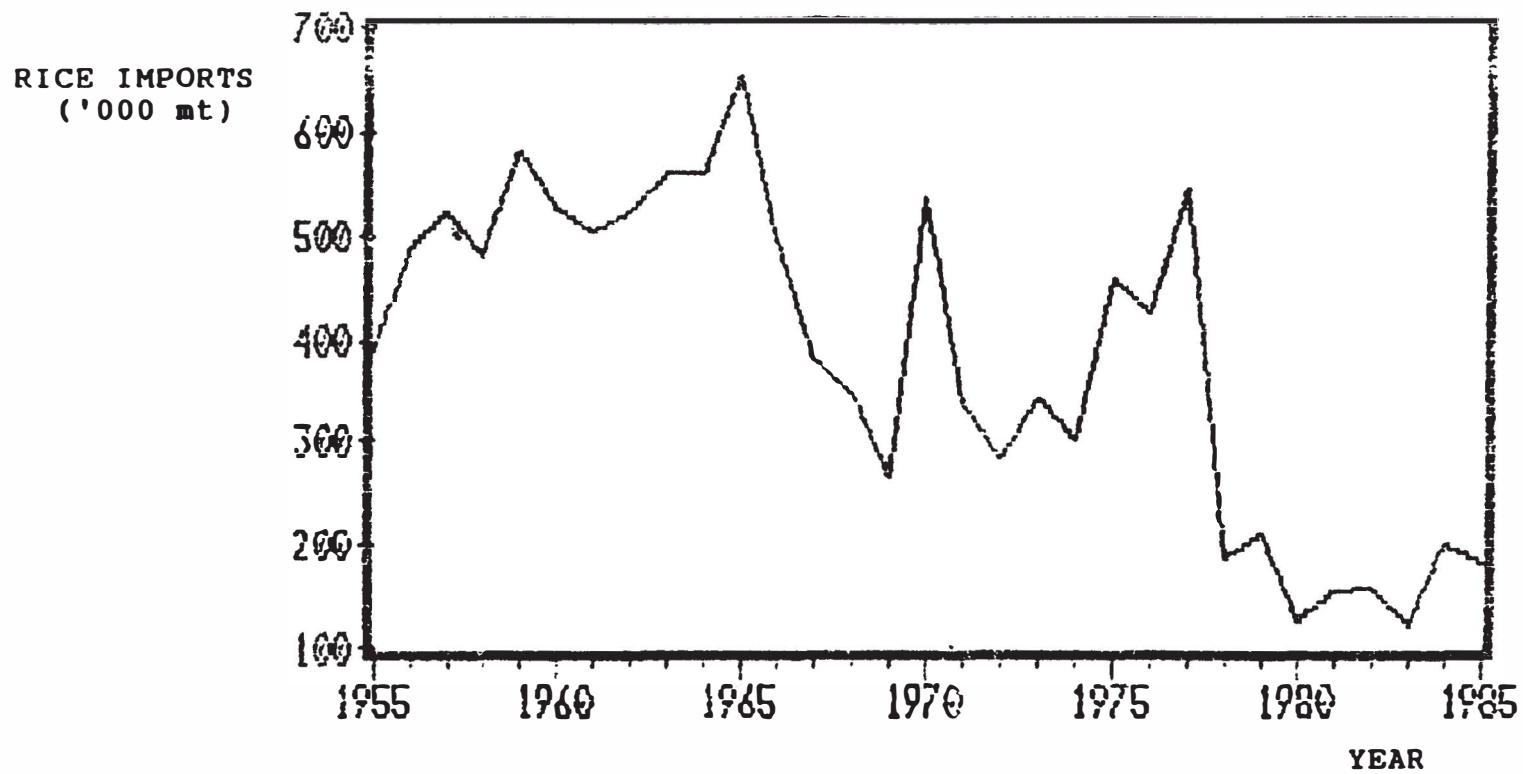


Figure 3

Rice Imports, Sri Lanka, 1955-1985

Table 2
Changes in Rice Rationing Scheme

Date	Quantity (pound/person/week)			Price (cent/pound)
	Free	Paid	Total	
1942	0	2.0	2.0	12.5
July 1953	0	2.5	2.5	53.0
October 1953	0	2.5	2.5	27.5
November 1954	0	4.0	4.0	27.5
May 1955	0	4.0	4.0	25.0
October 1955	0	4.0	4.0	12.5
May 1956	0	4.0	4.0	20.0 ^a
June 1958	0	4.0	4.0	12.5 22.5 ^a
June 1959	0	4.0	4.0	12.5
April 1960	0	4.0	4.0	12.5
December 1966	2	0.0	2.0	0.0
September 1970	2	2.0	4.0	37.5
February 1973	2	2.0	4.0	50.0
October 1973 ^b	1	2.0	3.0	100.0
April 1974	1	1.0	2.0	115.0
August 1974	1	1.0	2.0	110.0
March 1975	1	1.0	2.0	110.0
November 1975	1	1.0	2.0	100.0
1977	1	3.0	4.0	100.0

Source: The Impact of Public Foodgrain Distribution on Food Consumption and Welfare in Sri Lanka.

a: The price for the first two pounds was 12.5 cents and for the next two pounds 22.5 cents.

b: Income-tax payers were no longer eligible for free ration rice.

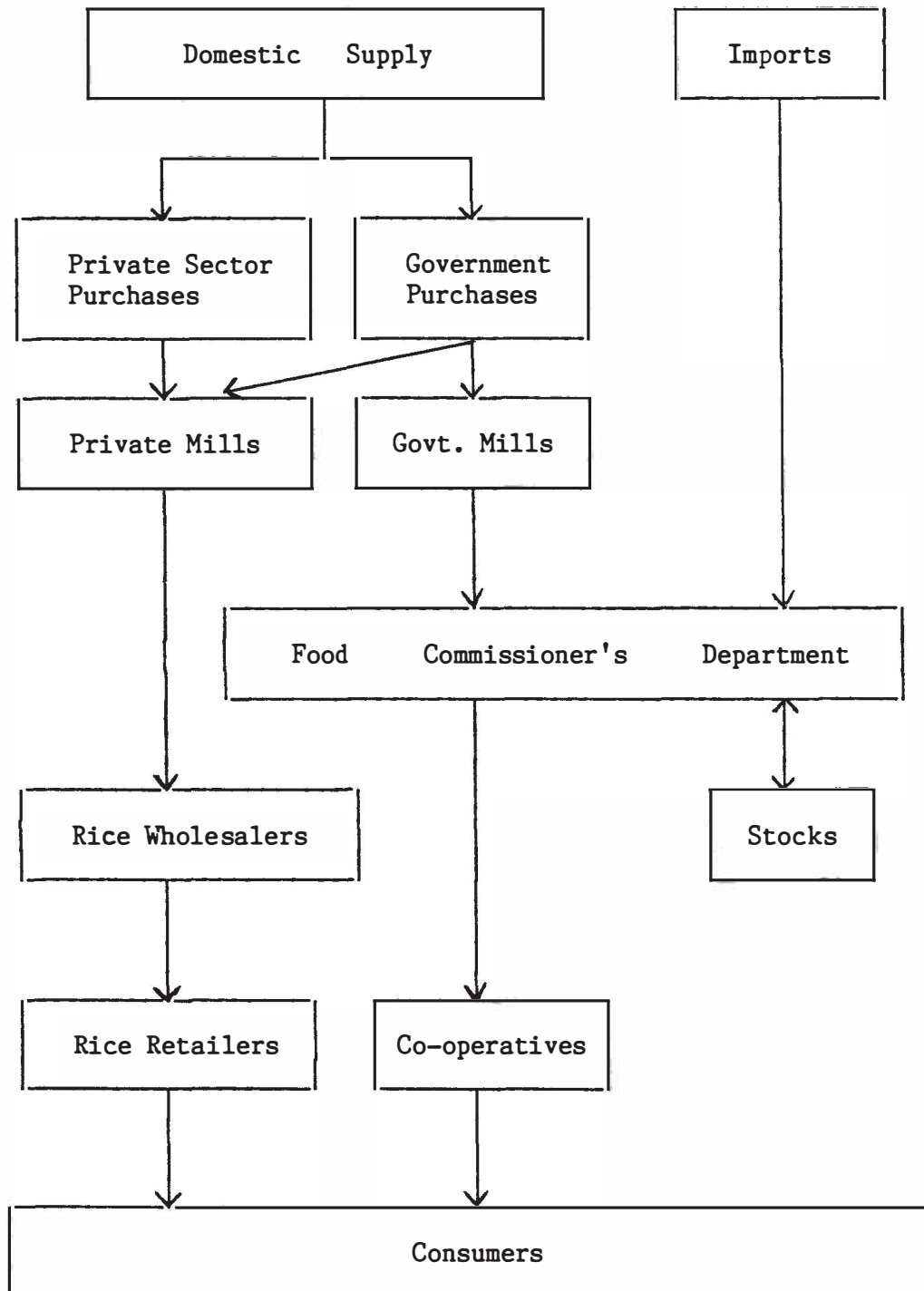


Figure 4

Distribution of Rice, Sri Lanka