FUTURE RICE PRODUCTION POLICY IN SRI LANKA: GLOBAL AND NATIONAL PERSPECTIVES

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Abstract

In spite of significant advances in rice production in the past few decades there is a rising concern about declining profitability, lack of international competitiveness and restricted scope for expansion of future rice production in Sri Lanka. This paper reviews the consequences of the problems and attempts were made to draw policy options to sustain the rice sector in line with emerging trend of world rice economy. Incremental change on global average of per capita demand for rice is projected to be small (83kg in 1990 and 85kg in 2020) and the global demand for rice is projected to increase at 1.95 percent per annum which is resulting from population growth. Global rice production on the other hand is estimated to increase at 1.62 percent per annum. However, tradable volume of rice will be doubled as a result and the world rice price is expected to decline at 0.73 percent per annum and the estimated world price would be US$ 180 per Mt. Domestic prices of rice is higher by US$ 50-75 per Mt. Thus domestic cost of production should be brought down by 25-30 percent in near future in order to be price competitive in the international market. Domestic resource cost ratio at disaggregate level indicates that the high potential regions possess comparative advantage while the low potential areas do not. This *prima face* implies that Sri Lanka should concentrate on rice production only in the former. However, the so called low potential areas constitute about 35 percent of the total paddy land. Also land and labour movements away from rice sector are slow and availability of alternate opportunities for these resources is restricted. When the resulting low shadow prices are taken into account even the low potential areas show comparative advantage. Hence, rice production in these areas can not be ignored and steps are needed to enhance the total factor productivity and thereby the income of the producers. On food security grounds near self-sufficiency is desirable in the case of rice, as it is the staple diet. Even if the yield is increased up to 6mt/ha, the production from high potential areas alone is inadequate to achieve this goal. Therefore, attempts on producing rice in the low potential areas in cost effective manner is justifiable. Improving factor productivity would require research to raise yield ceiling in the long run and extension service in order to bridge the yield gap in the short run, in both high and low potential areas. Policies are needed to develop the farm units in which 70 % of farmers cultivating only 30 % of total paddy, land in order to achieve the economies scale. Farmers should be provided with accessibility of effective financial service to mechanise the operations like harvesting which is labour intensive and costly at current wage rate. Tapping of appropriate technology available in the rest of the world, securing efficient land and capital markets, creation of market acumen and generation of rural employment opportunities to facilitate the mechanisation are the major activities that demand the government attention along with research and development efforts in order to sustain future rice sector of Sri Lanka.

INTRODUCTION

Sri Lanka's rice sector has achieved spectacular results in last 4 decades. The total rice production increased rapidly and reached 2.87 million Mt in1999 recording the highest ever production and this is equivalent to a self-sufficiency ratio of around 95 percent. The policy environment characterised by trade protection and

input subsidies favoured this performance in the paddy sector during the last 4 decades. However, trade liberalisation and country's commitments to various trade agreements have forced the rice sector to shift towards free market orientation exposing the domestic rice sector to competitive global rice market.

On the contrary, yield stagnation, increasing input costs and declining profitability of rice production poses a question weather the performance of future rice sector is progressive enough and if not what kind of policy interventions are required to enhance its competitiveness. Given this setting, this paper attempts to examine the world trend as well as national rice production, consumption, trade, assess the productivity and recommend the policy options that could sustain and enhance competitiveness of domestic rice sector in line with the rest of the world.

PERSPECTIVE OF DEMAND FOR RICE

With increases in income, people have the tendency to substitute low cost sources of energy such as coarse grain for rice. But at higher levels of income rice becomes an inferior good. As income increases, people go for a diversified diet and substitute rice for high value, quality food with more protein and vitamin. Japan, South Korea and Thailand among Asian counties have passed through these phases and have experienced a decline in per capita rice consumption. However, there are countries in Asia such as India and China which have not yet reached the income thresh hold level at which consumers substitute rice for high quality foods. As pointed out by Hung *et al.*, (1996) income elasticity estimates provide little insight into which phase Sri Lanka is belong to. However, according to the latest consumer finance survey (Consumer finance survey 1996/97), it is clear that the consumption of rice increases with income.

Other factor that will dampen the demand for rice is urbanisation. About 52% of the developing world population will be living in urban areas by 2020. Sri Lanka's level of urbanisation is still low and country's urban population is estimated at about 22 % of total population. Growing urbanisation reduces per capita rice consumption. This is demonstrated from the evidence from Sri Lanka where for the same level of income the per capita consumption of rice is low by about 32 % in urban areas compared to rural areas.

The major boost in demand for rice comes from population growth. The world population is projected to increase by 32% between 1999 and 2020 and reach 7.5 billion in 2020. About 97.5% of population increase are expected to occur in the developing world. In Sri Lanka population is estimated to be 20.7 million in 2010. According to the IFRI'S IMPACT (Rosegrant *et al.*, 1995) model under baseline scenario the global demand for rice will grow by about 2% per

year between 1990-2020. The demand in Sub Saharan Africa will grow at 3.22 per annum much faster than that of other countries resulting from expected modest increase in income. The demand for rice in South Asia and Southeast Asia except China is projected to grow at 3.3 and 2.3 per annum, respectively. In China it is projected to grow at only 0.94 percent per year. The future demand for rice in Sri Lanka was computed by using per capita consumption and projected population assuming that effect due to price and income will be small since price and income elasticity of demand for rice have been reported to be very low (Samarathunga, 1984). Table 1 presents the future rice demand in Sri Lanka computed using 106 kg per year as conservative requirement. Accordingly the demand for rice will grow by about 1.1 percent between 2001 and 2010 in Sri Lanka.

Perspective of production

While the demand for rice continues to grow there are signs that a deceleration in the growth of rice supply has begun to set in. The annual growth in global rice production was only 1.7% per year during the 1985-1993 period compared with 3.2% during the 1975-1985 period. Global paddy production will increase by 1.6 percent per year (Rosegrant *et al.*, 1995).

Figure 1 illustrates the trend in paddy production, sown area and yield per ha. in Sri Lanka. At a glance it is apparent that the rice production increased rapidly until the mid 1980s and since then it has been stagnant around 2.5 million Mt per year while the sown area shows declining trend and the yield has increased rapidly until mid 1980s.

Table 1. Future rice requirement at 106 Kg. per capita per year.

Year	*Projected Population 000'*	*Future rice requirement at 106 Kg. per capita 000'Mt.*
2001	19016	2016
2002	19208	2036
2003	19402	2057
2004	19598	2077
2005	19797	2098
2006	19977	2118
2007	20156	2118
2008	20337	2156
2009	20519	2175
2010	20714	2195

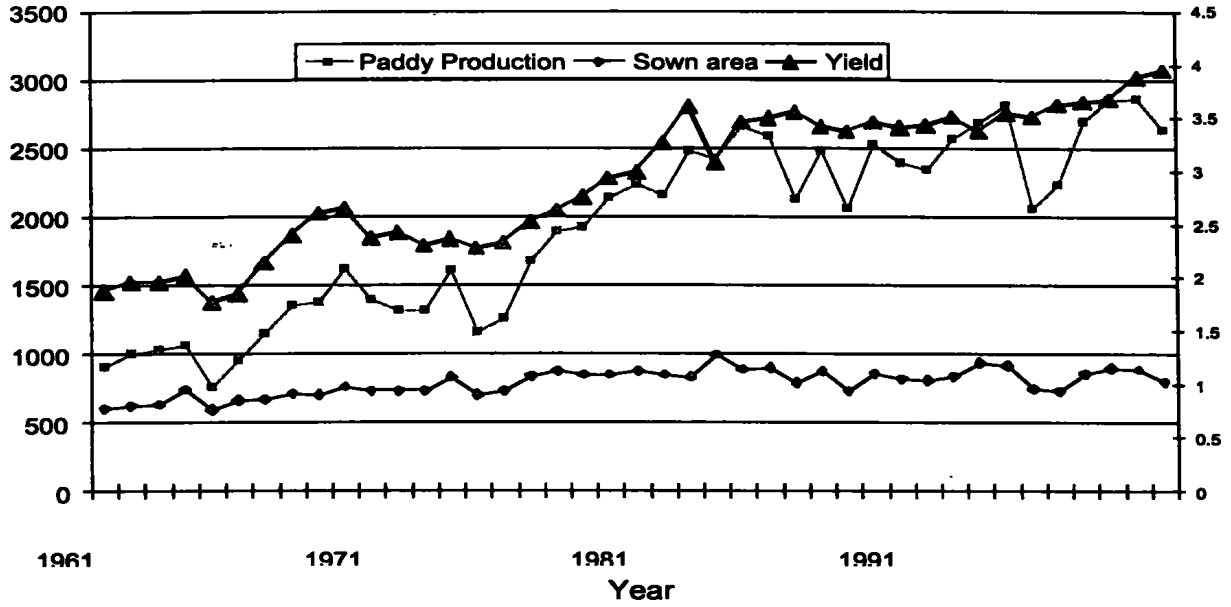

Figure :1 Trends in Paddy production(Mt), Sown area(Ha) an Yied(Mt/Ha) .

However, the increase in yield has decelerated and become stagnant at 3.5 Mt/ha level in the 1990's. In the first two decades as shown in the Table-2, rice production has grown at 18% and 4% per annum, respectively and sown area and yield have contributed equally to the increase in rice production during the first decade. During the last two decades an increase in yield has just compensated for decrease in sown area keeping the total production at the stagnant level.

If it is assumed that the present production growth rate will continue up to 2010 and present deficit will be widen over time. Nevertheless using optimistic national average yield increase of 4.5 t/ha by 2005 and stagnate at that level Sri Lanka can hope to meet the demand with domestic supply by 2004 (Table-3).

Table 2. Growth rates (% per year) of sown area, average yield and rice production 1970-1999.

Year	*Sown extent*	*Average Yield*	*Production*
1972-1979	7	4	18
1982-1989	-5	9	4
1992-1999	-2	5	1

Table 3. Estimated future rice requirement and estimated domestic rice supply under two scenario.

Year	*Requirement at 100 Kg. per capita 000'mt.*	*PRODUCTION SCENARIO*	
		Current Growth Rate	*Optimistic Projection 000'mt*
2001	*2016*	*1587*	*1881*
2002	2036	1597	1961
2003	2057	1607	2041
2004	2077	1616	2121
2005	2098	1626	2201
2006	2118	1636	2201
2007	2137	1646	2201
2008	2156	1655	2201
2009	2175	1665	2201
2010	2195	1665	2201

Rice trade

The international rice market is very thin and about 4 % of the world rice production is currently traded internationally. However, according to global forecast (Rosegrant *et al.*, 1995) current rice trade will double over time. In sub Saharan Africa rice imports are expected to double over the next two decades. Japan is also projected to increase its Japonica rice imports significantly and it opens up its market in compliance with new GATT policy. The major rice importers today are sub Saharan Africa, the European Economic Community, Iran and Saudi Arabia. Thailand, Vietnam and US are the most important rice exporters accounting for about 59% of the exports.

Rice prices

IFPRI projects that by the year 2020 rice prices will fall by 0.73 percent per year and price of rice will be around 181 US$ per Mt. The price decline is related to increase in tradable volume in the international market, caused by developed countries. In the world market, average price of rice is 192 US$ per Mt. However, prices vary (Table 4) from 275 US$ per mt(US2/4 %) to 190 US$ per mt.(Thai 100B) depending on rice type (Rice market Monitor October 2000). Currently price of rice in Sri Lanka ranges from 231 US$/Mt to 256 US$/Mt. In order to be price competitive in the international market the domestic cost of production should be brought down by 25-30 percent in near future.

Table 4. Export prices for rice.

Type	*F.O.B Price US$. Mt.*
Thai 100 B	190
Thai 35%	155
Thai A1 Super	139
Viet 5%	172
India 25%	220
Pak 10%	196
US2/4%	275

Domestic Rice Production System

Rice production system in Sri Lanka could be categorised as high potential and low potential areas. These two systems differ from one another in several characteristics. They are summarised in the following Table 5.

Cost of production

Cost of Production in nominal terms was estimated as Rs 7.33 per Kg in the high potential areas and Rs 10.74 per Kg in the low potential areas. It was observed that the cost of production is high in low potential areas when compared with high potential areas.

Table 5. Characteristic of rice production system.

System	Yield	Farm size	Water regime	Cropping.Inte.
High Potential	4.2	> 1	IR	>120
Low Potential	3.0	< 1	RF	<100

High potential areas comprise 65% of the total paddy land with average yield level of 4.2 mt/ha while low potential areas constitute 35 % of the paddy land contribute average yield level of 3.0 mt/ha.

Pollannaruwa and Anuradapura from high potential areas and Kalutara and Matara districts to represent the low potential areas were selected in order to examine the productivity and profitability of rice sector.

It was also noted that cost of production has declined marginally by 2.6 percent (Figure-2) between 1989 to 1999 in the high potential areas.

Among the components of cost of production in high potential areas labour constitutes the largest share which is 46 percent. Materials are responsible for 25 % and 29% has been spent on farm power. In the low potential areas 57%of the cost is on labour while 35 % and 21% are spent on materials and power, respectively.

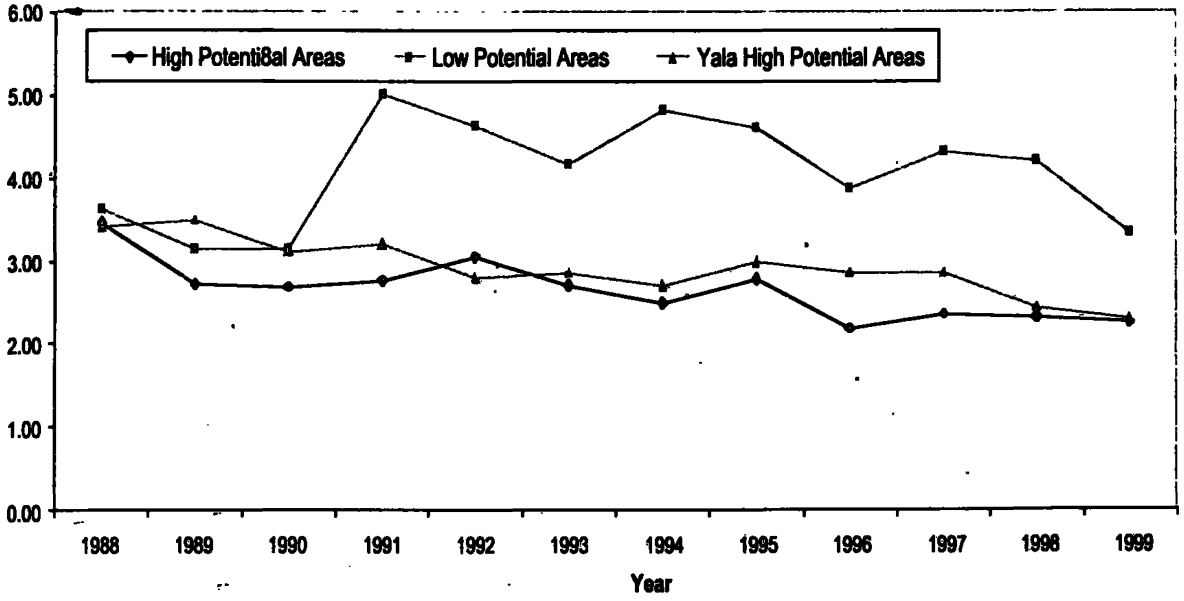

Figure 2 .Cost of Production of Paddy

It shows that the labour input is the most significant component of total cost of production in both high and low potential areas. High potential areas utilise 70 % of hired labour whereas in low potential areas utilisation of family labour is high and the percentage was 67.

Paddy price

Analysis shows that despite frequent price fluctuation in the short run, domestic price is declining over the long run(Figure 3).

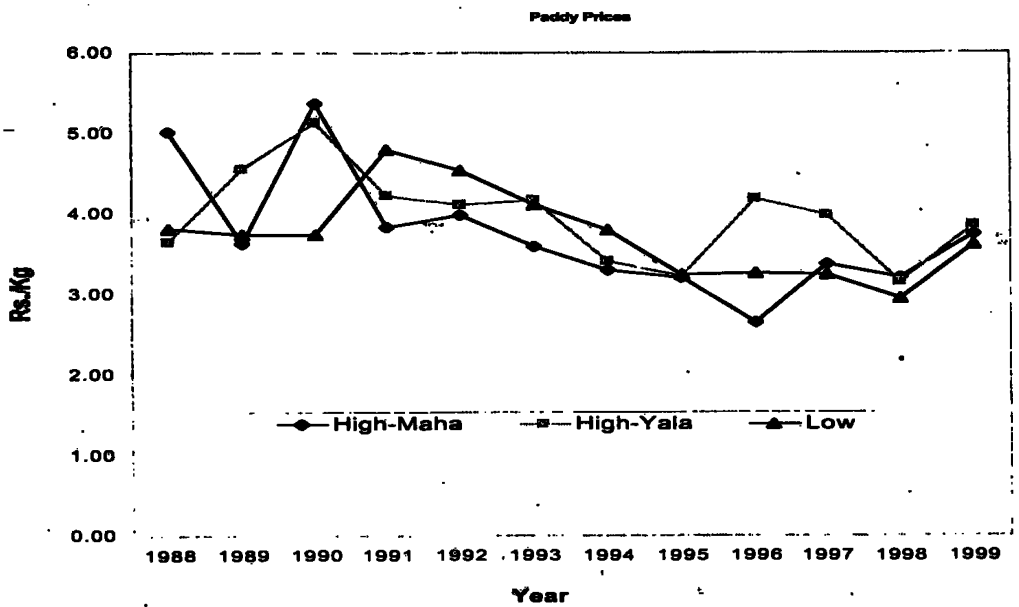

Figure 3. Paddy prices during *Maha* and *Yala* from 1998 to 1999.

The rate of this decline is about 16.5%, as these prices are not determined by market forces, but controlled by institutional and imports trade policies. Our interest here is to reflect the consequences of the price decline on the rice producer. Although, government has some form of protection of the domestic producers from price fluctuation, the long term price declining trends are passed on to them. Consequently this affects the welfare of the rice producer.

Yield Gap

It is reported that the yield potential of all new improved varieties is about 10 mt/ha (Abeysiriwardane,1995). But the actual average yield obtained from these varieties is about 3.5 mt/ha at present. However, recent studies reveal that actual average yield could be increased to 5-6 mt/ha. Therefore, yield gap can be reduced and average yield could be increased by 1.5-2.5 mt/ha. In future, attempts should be made to improve the total factor productivity to diminish the yield gap while reducing the cost of production. Recent statistics show that pesticide use has declined significantly without a consequent reduction in yields. This shows the effectiveness of IPM programme that contributed to reduce the cost of production and pave the way to use agrochemical more judiciously. In this respect, other available techniques should be promoted to increase the input use efficiency.

Profitability

Figure 4 shows the profitability trends in the paddy prodution. In high potential areas profitability has declined by 2.4 % per year in real term where as in the low potential areas the profitability has decreased by 6.4 % per year.

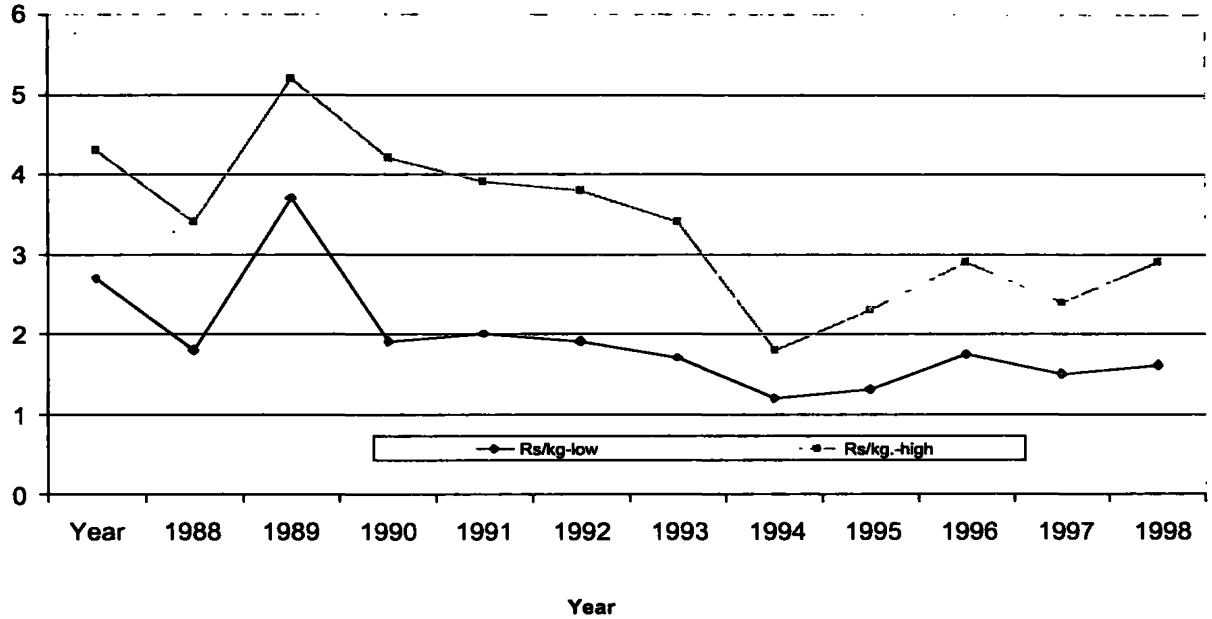

Figure 4. Profitability trends in paddy prodution.

Generally profitability in both areas have declined mainly due to reduced paddy prices and increasing wage rates.

Comparative advantage

Domestic resource cost (DRC) is one of the commonly used indicator for comparative advantage of agricultural production (Rafeek and Samaratunge, 2000). This indicator represents the production efficiency. Estimation of average domestic resource cost (DRC) for both high potential and low potential areas for both *yala* (1994-1998) and *maha* (1994/95-1998/99) seasons is given in table 6.

efficient when compared with high potential areas. But these estimations are based on the national aggregate level of conversion factor 0.758 that was used to value the shadow value of the resources which is different from market value. However, it is observed that opportunity cost of resource used in these low potential areas apparently is very low due to the slow movement of resource and lack of available opportunities. Under such a circumstances, comparative advantage is re- estimated assuming low value of 0.58 as the conversion factor to convert these resources into real value and the new ratio was given in the parentheses.

Table 6. Average Domestic resource cost in high and low potential areas.

High Potential areas	*Yala 1994-98*	*Maha 1994-98*
Anuradhapura	0.95	1.08
Pollonnaruwa	0.97	1.02
Low Potential areas		
Kalutara	1.60(0.99)	1.89(1.1)
Matara	1.20(0.86)	1.31(0.9)

High potential areas ratio indicates that production is economically efficient during *yala* season. For instance, Anuradahpura shows the value of 0.95. This state that 0.95 cents worth of resources are used to produce one rupee worth of rice, this is a clear comparative advantage of rice production. And same high potential areas marginally efficient during *maha* season mainly due to seasonal yield variation. High DRC ratio reported in low potential areas shows that rice production in these areas is not

According to these estimation these low potential areas also becoming comparative advantage and farmers in these areas continuing their cultivation.

CONCLUSION AND POLICY IMPLICATION

The current yield stagnation, yield gap, decline in real prices and increase in real wage rate exert downward pressure on the profitabilty of paddy production. As a result, paddy farmers have ended

up with low income and economic viability of paddy producres are serious indeed. Sustaining the profitability and maintaining competitiveness of paddy production will require concerted effort to raise the current yield ceiling, diminishing the yield gap and increase the total input use efficiency. In any case, the net results of policy action would be a reduction in the unit cost of paddy production. Initiatives in each of these issues are needed for both high and low potential areas.

High Potential Areas

Diminshing the yield gap between farmers and research yield is important. An understanding the reason for this yield gap must be a short term priority. Perhaps this issue which has not received significant attention to date, should rank as important as that of increasing the yield ceiling in the future. Long term research will of course concentrate on raising the yield ceiling. This requires collaborative research at international level to import the technology in par with the rest of the world. In high potential areas with access to irrigated water, attempts to improve the total factor productivity is a must. Integrated Pest Management (IPM), Integrated Plant Nutrient Mangement (IPNM) and mechanization are few options available for farmers to adopt and improve the domestic input use efficiency.

Low Potential Areas

The areas that come under low potential category are diverse, but in general yields are constrained by production instability resulting from drought, flood , water logging and inherent infertility of soil. To raise yield, it is essential to develop stress resistant varieties to improve the yield stabilty in long run. Cultivation of paddy in these areas is confined to one season per year. Is there any potential for increasing the cropping intensities of cultivation on these lands ?. It may be possible with short aged varietis and a better package of technology which could only be generated with problem specific research. Further, an attempt of achieving economies of scale in these areas is another priority.

More holistic integrated approach would be required in future research on high and low potential areas to address critically in order to make sure the contribution of every production factors to the overall cost and productivity, can substantially reduce input cost while maintaining the yield level. In addition, farmers expect the government to play facilitative role on securing efficient land and capital market, creation of market inteligence and information and generation of rural employment opportunities are the some areas which influence future rice production in an efficient manner.

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DOMESTIC MARKETING SYSTEM FOR PADDY AND RICE

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Abstract

After the introduction of open economic policies since 1977, paddy/rice marketing sector has undergone substantial structural changes. Direct government involvement has reduced significantly and the private sector has taken over marketing activities. The activities of the Paddy Marketing Board (PMB) were curtailed gradually and its operation ceased completely from 1996. Guaranteed Price Scheme (GPS) was not in operation after 1993 when the last price revision was made (Rs.7.52/kg). The reason for this was reduction of government expenditure under the structural adjustment programmes in which the private sector was expected to undertake direct marketing activities. However, the private sector involvement in paddy/rice marketing has been questioned recently when paddy prices dropped drastically during harvesting times and increased significantly during the slack period. Traders argue that this has happened due to business uncertainty resulting in the *ad hoc* government decisions on price setting for paddy and rice imports. In these circumstances it is vital to examine the paddy/rice marketing situation under the open economy. This paper attempts to review the organization, operation and performance of the paddy/rice marketing. The paper is mainly based on secondary data and informal discussions with market participants on the subject concerned. Marketing system organization and operation is reviewed based on the findings of earlier studies and informal discussions with market intermediaries. Price information collected by Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) has been used to analyze the market performance. Statistical techniques such as coefficient of variance and regression analysis have been used for market performance analysis. The paper discusses the importance of the paddy/rice marketing in the economy, describes the different types of market participants with their roles and marketing channels and reviews marketing operations including buying/selling arrangements, transportation, packing, grading, storage, standardization, processing and marketing support services such as market research, marketing intelligence service and marketing credit. The other aspects reviewed are performance of the marketing activities, performance evaluation indicators such as seasonal price variation, price stability, price trends and marketing margins. The paper provides recommendations needed to develop an efficient and effective paddy/rice marketing system for the country.

Introduction

INTRODUCTION

Paddy/rice marketing has been the most important among the commodity marketing system due to number of reasons. First, earnings derived from paddy contribute the principal income source of vast majority of the farmers especially in the Dry Zone. Reduction of paddy prices therefore has a significant impact on the wellbeing of farming community. Second, rice is the staple food of all Sri Lankans and nearly 79 percent of the country's households depend on open market to meet their rice requirements. Third, rice is the biggest expenditure item in the consumer food basket accounting for 20 percent of the total food expenditure. This means that a small change in rice prices has a large impact on food expenditure, which represents over 50 percent of the total household expenditure. Finally, rice is the

dominant source of energy registering 44 percent of the daily total calorie intake. It indicates that nutritional level of the people is mainly determined by rice.

Having identified the importance of the paddy/rice marketing, successive governments since independence have placed special attention on it. However, after the introduction of open economic policies since 1977, this sub sector has undergone substantial structural changes. Direct government involvement has reduced significantly and the private sector has taken over the marketing activities. The activities of Paddy Marketing Board (PMB) were curtailed gradually and its operation ceased completely from 1996.Guaranteed Price Scheme (GPS), which was introduced in 1948, was not in operation after 1993 when the last price revision was made (Rs.7.52/kg). In these circumstances, paddy marketing today is in the hand of the private sector. However, the private sector involvement in paddy/rice marketing has been questioned due to sharp drop in paddy prices at harvest times and sharp increase in rice prices at slack period. Traders argue that this happens due to business uncertainty resulting in the ad hoc government decisions on price setting for paddy and rice imports. The alternative argument is that traders control the both paddy and rice market. One thing is clear that paddy/rice marketing has been a problem at present and its impact to the society is severe. Eventually, paddy/rice marketing has become a political issue. Since problem identification is a key to solve a problem, it is vital to examine paddy rice marketing situation under the open economy.

METHODOLOGY

The structure, conduct and performance approach, which is widely used for commodity system analysis is used to review paddy/rice marketing sector in Sri Lanka. Market structure refers to how the market is organized. This includes type of market participants, the degree of seller buyer concentration, market entry conditions and product differentiation. Analysis of marketing channels is a major tool used to describe the market structure. Market conduct means how the market operates. Role of the marketing is coordination between production and consumption. A variety of activities such as buying, selling, transportation, storage, processing and market regulation and policies, have to be performed to achieve this goal. These activities are called marketing functions, which is often described under the section of market conduct. Market performance represents the economic results of structure and conduct. Price is the indicator used to evaluate the performance of marketing activities. Therefore, price analysis is carried out in this section. Price data collected by the Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) is used for this task. Statistical techniques such as coefficient of variance, coefficient of correlation and regression analysis were employed in price analysis.

Marketing structure

Marketing structure in relation to the paddy/rice could be divided into five levels: 1) farm, 2) assembly, 3) processing, 4) wholesale and 5) retail. These five levels link vertically in the structure. These linkages show graphically in the marketing channels, which are explained, latter. Also, a large number of people are involved and perform number of activities, which are interrelated. These people are refereed to as the market participants, including farmers and consumers. Those who are in between the farmer and the consumer are called market intermediaries. Market participants are described in the following section.

Market participants

There are two categories: direct participants and indirect participants. Direct participants are those who are involved in buying and selling activities of paddy/rice, which change the ownership of the commodity. Farmers, assemblers, processors (millers), importers, wholesalers, retailers and consumers are the major direct participants. Indirect participants are those who undertake supporting activities such as transport. They are transporters, brokers and commission agents. The government performs both activities. Cooperative Wholesale Establishment (CWE) and Multi Purpose Cooperative Societies (MPCS) involve in buying and selling activities while organizations such as HARTI (market intelligence), Sri Lanka Standard Bureau (standardization), Fair Trading Commission (market regulations) and Banks (credit) provide supportive services.

Direct market participants

Farmers:

Farmers are the first hand seller in the system. There are two groups, those who mainly produce for the market and those who mainly produce for the consumption. The former group is important in marketing because their marketable production is high often more than 50 percent of the production. Farmers in the dry zone belong to this category. For example farmers from districts of Ampara, Polonnaruwa, Anuradapura and Kurunegala have over 75 percent of their production for sale. The figure for Hambantota district is little lower (65%) because payments in kind are high. Many farmers have less than one hectare of land for paddy cultivation. They are unorganized, less market oriented and belong to the old age groups.

Assemblers:

They are the first buyers of the system. These traders are often called collectors. Some of them are paddy producers, input suppliers or grocery traders. Although paddy is the largest commodity grown in the country, the country does not have assembly markets. Many collectors are located in the producing areas and few are in the towns in the area. These traders enjoy market power because they are scattered and the number is limited. Assemblers have backward and forward linkages. They have developed backward linkages with

farmers as the suppliers of provisions input such as fertilizer and agro-chemicals or draft power (tractors and buffaloes), consumer products and credit. Forward linkages have established with millers by getting orders in advance, borrowing money and delivering paddy to the mill. A very few hold stocks due to lack of storage facilities and finance.

Processors:

Millers belong this category and could be divided into two: custom millers and commercial millers. The former serves for the paddy farmers by milling their paddy for consumption while the latter operates large scale milling of paddy and selling rice in wholesale. Commercial mills are centralized in certain locations mainly in the paddy producing areas. For example, in the Hambantota district a large number of mills are located at Tissamaharama and Amblantota areas. Similarly, many millers in the Ampara district are located in Kalmune and Samanturai areas. Besides, there is a group of paddy millers established in the rice consuming area of Maradhagahamula in the Gampaha district. It is a unique case in the country. There are about 200 paddy millers in this area. Most of the commercial paddy milers are either small scale or medium scale businessmen. At Maradagahamula, about 25 out of 200 millers are at medium level and all the others are small processors who produce 16 bags (65 kg per bag) of rice per day. Millers are interested in short-term profit and hence their investments are limited to paddy storage. Few have invested in transport by purchasing vehicles for paddy/rice transportation. This results in lack of improvement in processing industry. Modern paddy mills in the country are lacking.

Importers:

Until 1993 rice import was a sole responsibility of the government. The Food Commissioner's Department had the monopoly power in rice imports till it was given to the CWE in 1990. The CWE continued the monopoly right in rice imports till 1993 when the private sector was allowed to import rice under licenses. In 1996 the government removed the licenses allowing anyone to import rice at any time at a specified duty. As a result, rice importers increased but the number is still small because of high investment required

Wholesalers:

There are two groups, millers and rice wholesalers. Millers are the biggest group. Rice wholesalers have established in the major consumer towns and their major customers are retailers. At Maradagahamulla there are about 70 rice wholesalers. In Colombo, wholesalers are located at 4th and 5th cross street. Wholesalers often maintain carry over stocks only and purchase rice mainly from millers.

Retailers:

Those who are selling rise to the consumers belong to this category. Many of rice retailers are grocery traders who are also selling other consumer goods. Rice specialized retailers are emerging.

The number of retail outlets called "Sahal Sala" is on the increase and the rice specialized retailers in polas too have increased. It was also observed that the number of rice retailers has increased in the country enhancing competition in the market. Further, some wholesalers in towns have commenced in selling rice to the retailers in bulk form at a lower price than that of retail price.

Consumers :

They are the end users of the market but influence in determining prices. The per capita consumption of rice is 106 kg per annum and the trend is on the increase further because income elasticity is positive. The majority of consumers still consume lesser amount of rice compared to the national average. Demand for quality rice is on the increase because of increasing consumer incomes, urbanization and employed women in the labour force.

Indirect Market Participants

Brokers :

The role of the brokers is to connect buyers and sellers. Brokers exist when there is no close relationship between two parties. In the Polonnaruwa and Ampara districts transactions take place at farm level through brokers. Millers purchase paddy from collectors through brokers. The miller has to pay Rs.200 to the broker per lorry load (6500 kg).

Transporters:

At assembly level, few farmers have tractors, which are mostly used for transportation paddy from paddy field to home and from there to selling center. At the wholesale level, many millers have their own lorries and retailers use hired lorries.

Marketing channels

There are number of ways that products reach the ultimate consumers from the producers. This is often explained in a flow chart (Figure 1). Although the figure indicates different marketing channels available for farmers it does not means all the channels are available for all farmers everywhere. Availability and significance of the channels vary by locations (Table 1). Only one farmer in the sample has sold to the miller in the Polonnaruwa district while in Hambantota the number was 41. The farmers in the Hambantota district have close link with millers. All other paddy surplus district collectors are dominant at farm level. The government marketing channels (CWE & Coops) are not accessible to many farmers because of a number of reasons such as inadequacy of purchasing outlets, delayed payments, long waiting time for sale and strict quality inspection. Collectors are the major suppliers of paddy to the millers. Millers sell rice to the wholesalers and retailers through commission agents, which is an age old system, but still prominent. However there are two emerging channels. The first one is millers selling rice to wholesalers directly at the mill.

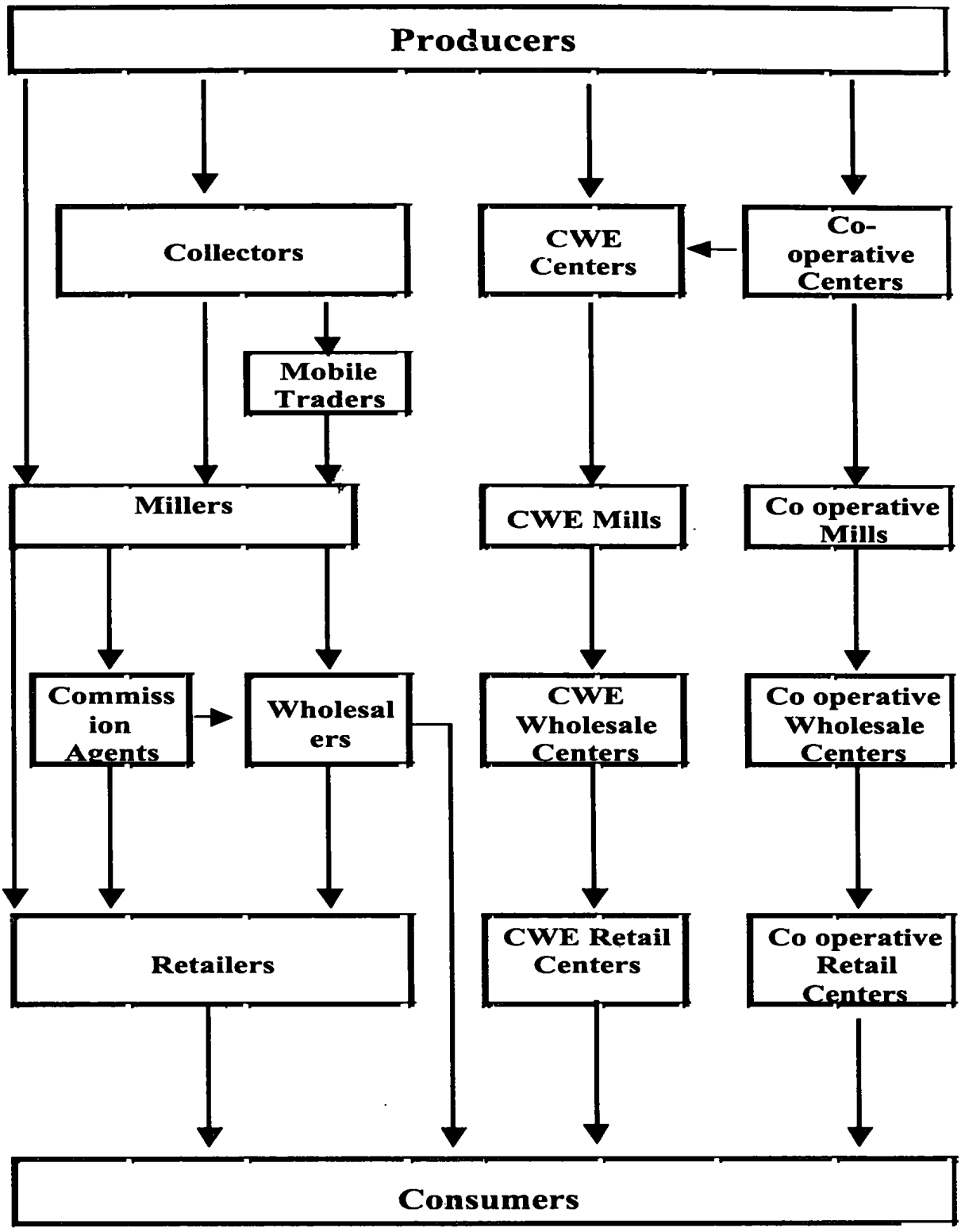

Figure 1. Marketing Channels for Paddy and Rice

Table 01. Sales Paddy by Farmers.

Sales to	*Ampara*	*Anuradhapura*	*Kurunegala*	*Polonnaruwa*	*Hambantota*
Collectors	35	50	52	66	14
Millers	07	19	17	01	41
CWE	01	04	04	09	00
Co-Operative	10	05	02	10	04
Total	53	78	75	86	59

Source : Stock Assesment Survey 2000 Yala / HARTI

The second one is direct selling to retailers after delivery. Millers who have lorries introduced these new channels are becoming popular among the buyers due to cost effectiveness. As mentioned earlier, direct selling to consumers by town wholesalers is also commenced recently. This was introduced by CWE in early 1990s.

CWE purchases paddy through cooperatives and farmer organizations in addition to the direct purchase from farmers. Cooperatives have their own outlets at village level. Both these organizations process paddy into rice at their own mills. The CWE has given private millers a part of their paddy to mill in November this year in order to increase rice sales. Rice is distributed to consumers through their own outlets. The major reason for not expanding their channels is poor demand for rice from the consumers. Although they purchase the best paddy they cannot produce good quality rice attractive to consumers.

Marketing Operations

Marketing is defined as all the activities involved in movement of products from the producer to the consumer. This definition is based on marketing operations, which often refers to the marketing functions. In this section, marketing functions in relation to paddy/ rice is described. In theory, marketing functions are grouped into three: exchange, distribution and facilitative.

Exchange functions

This includes buying and selling activities, which take place at three stages; assembly, wholesale and retail. At assembly level, farmers are the sellers and buyers are collectors, millers and government organizations. Millers and collectors purchase paddy either at farmhouse or at their collection centers/mills. In the Hambantota district, millers purchase paddy at farmhouse during the harvesting season and farmers bring paddy to the mill during the off season. Farmers check the price before sale. However, the situation is different in Polonnaruwa. Collectors play a major role in paddy purchasing at farm level. Farmers bring paddy to the collecting centers and collectors bring paddy to the mill. In most cases, a broker supports by connecting buyers and sellers. He gets Rs.200 per lorry load (6500 kg).

Millers repack paddy and return bags to the customer. This process involves high cost in transaction compared to that of Hambantota. Millers are the major sellers and wholesalers are the major buyers at wholesale level. The traditional method is selling rice to the wholesalers/ retailers through commission agents. The commission fee is 3-5 percent of the sales value. This system is deteriorating and direct selling to customers are developing. In direct selling, two methods are operating; one is selling to visiting wholesalers at the mill and the other is delivering rice to the wholesalers and retailers sometimes. At retail level, retailers are the sellers and consumers are the buyers. Transactions take place on sport cash at retail level and on delayed payment at wholesale level. Both payment systems are operating at farm level depending on the relationship both parties involved.

Distribution Functions

Transportation, processing and storage are major distribution functions. Transport involves in movement of products from one place to another. Paddy transportation from the farm to the house and from there to the collecting centers/ mills takes place by tractors and by Elf-lorries. Rice is transported in lorries. After the introduction of open economic policies the number of trucks have increased and helped to establish direct sales between farmers and millers as well as millers and wholesalers/retailers. Availability is not the problem but accessibility is the problem due to high cost. At farm level transport charges more than doubled compared to that of wholesale and retail level. This is mainly due to bad road conditions.

At processing stage, paddy is milled into rice. Both raw and parboiled rice are produced. The out turn is less than 70 percent (mostly 65%), which is low compared to other countries. This is mainly due to lack of modern rice mills. This affects the quality of rice as well. Sri Lankan quality is not in line with international standards. The major change that can be observed is removal of infuriates in the rice. The broken percentage is still high. In case of parboiled rice, bad smell is the major problem. Processing cost is high; cents 75 for raw rice and Rs.1.50 for parboiled rice per kg. Labour cost is high for parboiling due to boiling and drying of paddy.

In Sri Lanka, paddy is stored and carryover stocks are maintained for rice except for imported rice. This is due to long keeping quality of paddy. Millers, collectors and farmers stock paddy. Millers maintain large stocks in order to operate the mill smoothly. Also, paddy storage needs high investment that millers can afford. Paddy storage by millers has increased after introduction of pledge loan system by banks. However, this trend declined during last three years due to uncertainty in the rice market resulting in ad hoc imports and procurement price. Storage at farm level has been curtailed due to cash flow problem and lack of storage. A recent survey conducted by HARTI found that farmers sell about

50 percent of the marketable production soon after the harvest to meet immediate cash and the balance is sold latter at the time of high prices or financial needs.

Facilitative functions

The role of the facilitative function is to facilitate the exchange and distribution functions to operate smoothly. They are standardization, market intelligence, market research, market regulations and marketing credit. The National Standard Bureau has made standards for paddy and rice. HARTI operates marketing intelligence and conducts marketing research. Department of Internal Trade and Fair Trading Commission are responsible for marketing regulations. Under the consumer protection act, price of rice should be displayed at retail level.

Market performance

Market performance is often evaluated through price analysis because price is the final outcome of the market operation. Price analysis consists of price trend, seasonal variation, price stability, price spread and price determination process. Prices collected by HARTI are used for these analyses as mentioned at the outset.

Price trend

This shows price change over the years. This should be analyzed both in nominal and real terms. Table 2 shows prices of paddy from 1991 to 1999. In case of nadu, market price dropped continuously for the period 1993 – 1995. In real terms prices are on the decline indicating farmers real income has dropped. Both wholesale and retail prices are on the increase in nominal term but on the decreasing trend in real terms. This means that consumers have been benefited.

Table 02. Price of Rice and Paddy (Rs/Kg).
Wholesale Price of Rice at Pettah Market.

Year	*Samba*	*%*	*Kora*	*%*	*Nadu*	*%*	*Raw Red*	*%*	*Raw White*	*%*
1985	9.33	-	6.45	-	7.56	-	7.11	-	6.52	-
1986	9.27	-0.69	7.14	9.70	6.81	-11.04	7.28	2.38	6.72	2.88
1987	10.71	13.47	7.58	5.88	7.03	3.17	7.48	2.62	6.95	3.30
1988	11.36	5.75	8.54	11.17	8.06	12.76	7.98	6.28	7.60	8.59
1989	14.19	19.92	11.57	26.20	11.17	27.87	11.03	27.65	10.42	27.10
1990	18.34	22.61	14.03	17.54	13.60	17.85	13.70	19.47	13.08	20.32
1991	18.21	-0.70	14.09	0.44	13.71	0.82	14.21	3.58	13.18	0.73
1992	19.34	5.85	15.52	9.22	15.11	9.27	16.32	12.96	14.20	7.20
1993	21.19	8.71	15.83	1.94	15.38	1.73	15.70	-3.95	14.27	0.53
1994	20.29	-4.44	15.58	-1.58	14.98	-2.67	15.13	-3.77	13.72	-4.04
1995	20.43	0.70	15.05	-3.57	14.55	-2.96	15.16	0.19	13.62	-0.76
1996	24.52	16.67	19.11	21.26	18.89	23.01	20.49	26.01	18.01	24.40
1997	26.25	6.61	20.09	4.87	20.04	5.70	20.49	0.00	19.18	6.11
1998	26.57	1.21	19.85	-1.19	19.84	-0.98	20.88	1.88	18.94	-1.30
1999	30.00	11.42	24.95	20.43	24.94	20.46	25.67	18.64	23.45	19.24

Retail Price of Rice at Colombo and Suburbs Market

Year	*Samba*	*%*	*Kora*	*%*	*Nadu*	*%*	*Raw Red*	*%*	*Raw White*	*%*
1985	10.93	-	8.18	-	7.31	-	8.47	-	7.71	-
1986	10.75	-1.70	8.37	2.27	7.46	2.05	8.41	-0.71	8.00	3.61
1987	12.23	12.13	8.71	3.90	8.01	6.88	8.69	3.21	8.26	3.14
1988	13.31	8.10	9.86	11.66	9.19	12.76	9.48	8.30	9.01	8.40
1989	16.20	17.83	13.13	24.90	12.69	27.59	12.86	26.33	11.87	24.05
1990	21.52	24.74	16.24	19.15	15.98	20.62	15.92	19.22	15.11	21.44
1991	20.87	-3.12	16.32	0.49	15.84	-0.92	16.50	3.46	15.20	0.64
1992	21.82	4.37	17.40	6.21	17.09	7.35	18.39	10.32	16.35	7.00
1993	23.41	6.80	17.65	1.42	17.22	0.74	17.75	-3.61	16.30	-0.31
1994	22.90	-2.25	18.09	2.43	17.23	0.05	17.52	-1.35	16.03	-1.64
1995	23.23	1.45	17.80	-1.63	17.06	-0.95	17.88	2.04	16.16	0.80
1996	26.98	13.89	21.54	17.37	21.28	19.81	22.75	21.41	20.19	19.93
1997	28.88	6.57	22.58	4.60	22.54	5.59	22.75	0.00	21.50	6.11
1998	29.52	2.16	23.13	2.38	22.79	1.09	24.33	6.51	22.00	2.29
1999	33.54	12.00	28.40	18.54	28.40	19.76	29.29	16.92	27.04	18.62

Real Wholesale Price of Rice at Pettah Market.

Year	*Samba*	*%*	*Kora*	*%*	*Nadu*	*%*	*Raw Red*	*%*	*Raw White*	*%*
1985	1.66	-	1.15	-	1.35	-	1.27	-	1.16	-
1986	1.53	-8.76	1.18	2.46	1.12	-19.94	1.20	-5.45	1.11	-4.90
1987	1.64	6.79	1.16	-1.39	1.08	-4.30	1.15	-4.90	1.06	-4.16
1988	1.53	-7.43	1.15	-1.25	1.08	0.56	1.07	-6.83	1.02	-4.20
1989	1.71	10.66	1.39	17.66	1.35	19.52	1.33	19.28	1.26	18.66
1990	1.82	5.98	1.39	-0.17	1.35	0.19	1.36	2.16	1.30	3.19
1991	1.61	-12.97	1.25	-11.70	1.21	-11.26	1.26	-8.17	1.16	-11.37
1992	1.53	-4.87	1.23	-1.12	1.20	-1.06	1.29	3.04	1.13	-3.38
1993	1.50	-2.01	1.12	-9.57	1.09	-9.81	1.11	-16.16	1.01	-11.15
1994	1.33	-13.26	1.02	-10.16	0.98	-11.35	0.99	-12.54	0.90	-12.83
1995	1.24	-6.92	0.91	-11.51	0.88	-10.86	0.92	-7.47	0.83	-8.49
1996	1.29	3.39	1.00	8.71	0.99	10.74	1.07	14.22	0.94	12.35
1997	1.26	-2.32	0.96	-4.23	0.96	-3.32	0.98	-9.57	0.92	-2.87
1998	1.16	-8.05	0.87	-10.67	0.87	-10.45	0.91	-7.31	0.83	-10.79
1999	1.25	7.26	1.04	16.70	1.04	16.72	1.07	14.83	0.98	15.45

Real Retail Price of Rice at Colombo and Suburbs Market.

Year	*Samba*	*%*	*Kora*	*%*	*Nadu*	*%*	*Raw Red*	*%*	*Raw White*	*%*
1985	1.95	-	1.46	-	1.30	-	1.51	-	1.37	-
1986	1.77	-9.85	1.38	-5.57	1.23	-5.80	1.39	-8.79	1.32	-4.12
1987	1.87	5.34	1.33	-3.52	1.23	-0.31	1.33	-4.26	1.26	-4.34
1988	1.79	-4.76	1.33	-0.69	1.23	0.55	1.27	-4.52	1.21	-4.41
1989	1.95	8.32	1.58	16.22	1.53	19.22	1.55	17.81	1.43	15.26
1990	2.13	8.56	1.61	1.78	1.58	3.56	1.58	1.86	1.50	4.56
1991	1.84	-15.68	1.44	-11.64	1.40	-13.21	1.46	-8.30	1.34	-11.47
1992	1.73	-6.52	1.38	-4.48	1.36	-3.21	1.46	0.10	1.30	-3.6
1993	1.66	-4.15	1.25	-10.16	1.22	-10.92	1.26	-15.78	1.16	-12.09
1994	1.50	-10.89	1.18	-5.81	1.13	-8.40	1.15	-9.91	1.05	-10.23
1995	1.41	-6.11	1.08	-9.43	1.04	-8.70	1.09	-5.47	0.98	-6.81
1996	1.42	0.17	1.13	4.21	1.12	7.03	1.19	8.88	1.06	7.17
1997	1.38	-2.36	1.08	-4.52	1.08	-3.44	1.09	-9.57	1.03	-2.88
1998	1.29	-7.01	1.01	-6.76	1.00	-8.18	1.06	-2.26	0.96	-6.87
1999	1.40	7.87	1.19	14.71	1.19	16.00	1.22	13.02	1.13	14.8

Market Price and Real Price of Paddy

Year	Market Price				Real Price			
	Samba	%	Nadu	%	Samba	%	Nadu	%
1991	8.21	-	6.96	-	0.73	-	0.62	-
1992	8.96	8.37	7.80	10.77	0.71	-2.07	0.62	0.00
1993	9.34	4.07	7.58	-2.90	0.66	-7.20	0.54	-14.99
1994	8.39	-11.32	7.05	-7.52	0.55	-20.73	0.46	-16.60
1995	8.77	4.38	6.99	-0.83	0.53	-2.96	0.43	-8.57
1996	11.26	22.06	9.72	28.05	0.59	9.64	0.51	16.58
1997	11.71	3.88	10.08	3.58	0.56	-5.31	0.48	-5.65
1998	11.15	-5.07	9.26	-8.85	0.49	-14.91	0.41	-19.05
1999	13.11	14.93	11.93	22.40	0.55	10.94	0.50	18.76

Seasonal variation

Production of agricultural commodities is seasonal due to biological factors. This has impact on market prices because demand is stable in the short run. The result is price fluctuation within the year that can be analyzed using seasonal price index. The index is calculated based on five-year monthly average prices. In computing the index values, the annual price is considered to be equal to hundred. Monthly index values explain deviation of the monthly prices from the annual price. The period where the index values are below the hundred indicates that supply is high compared to demand and vice versa.

Seasonal price indices were calculated for producer and retail prices using the data 1995-99 and results are presented in Table 3. Paddy prices fluctuate 14 percent up and 13 percent down for samba and 12 percent up and 13 percent down for other varieties compared to the annual price. During the period of February to September, paddy prices remain below the annual average. This is due to the impact of Maha production, which represent 60 percent of the total production. Rapid price drop commences in February with harvesting of paddy grown under major irrigation and continue until the harvesting is over in April. The reason for prices remained below the annual average till September is disposal of stocks gradually. The usual practice is releasing entire stock when Yala harvest comes in order to store Yala paddy. In case of samba, some stocks retain because of limited production in Yala. The interesting point is that prices do not drop during the Yala harvest time because of speculative demand from stockholders. Since the country has not produced excess rice yet prices are high during the latter part of the year as shown in Table 3. Stockholders, especially millers, keep paddy to get advantage during high price period. The lowest price registered in March because the bulk of the paddy crop is harvested during that period. Prices peak is in December.

The same pattern could be observed for retail prices but with little

changes. Retail prices reach the lowest in April not in March and the rate of price decline and increase is not as much as that of paddy. For example the lowest value of rice is 92 as against 87 in paddy. This is due to the traders behavior. Instead of fixed margin, the traders increase their margins in harvesting period and reduce in lean supply months.

Table 03. Seasonal Price Index.

Paddy

Month	Samba		Nadu	
	5 Year Average Price (Rs/Kg)	Seasonal Index	5 Year Average Price (Rs/Kg)	Seasonal Index
January	11.98	106.99	9.98	103.99
February	10.79	96.31	8.78	91.48
March	9.74	86.98	8.32	86.73
April	10.22	91.26	8.68	90.46
May	10.91	97.39	9.19	95.80
June	10.89	97.24	9.43	98.23
July	11.09	99.05	9.83	102.41
August	10.95	97.76	9.79	101.99
September	11.05	98.64	9.64	100.44
October	11.64	103.96	10.08	105.06
November	12.40	110.68	10.65	111.03
December	12.74	113.75	10.78	112.38
Annual Average	11.20	100.00	9.60	100.00

Rice

Month	Samba		Kora		NaduRaw Red		Raw White			
	5 Year		5 Year	5 Year	5 Year		5 Year			
Average	Index Price (Rs/Kg)	Average Value	Index Price (Rs/Kg)	Average Value	Index Price (Rs/Kg)	Average Value	Index Price (Rs/Kg)	Average Value	Index Price (Rs/Kg)	Value
January	29.39	103.95	23.48	103.49	23.12	102.84	24.93	104.57	21.99	102.52
February	29.39	103.95	23.30	102.71	23.00	102.28	24.89	104.40	21.87	101.97
March	28.20	99.74	21.58	95.09	21.26	94.57	22.68	95.14	19.86	92.59
April	27.00	95.49	20.93	92.24	20.62	91.70	22.24	93.27	20.00	93.23
May	27.68	97.91	21.46	94.59	21.25	94.53	22.48	94.30	20.43	95.22
June	27.86	98.54	21.91	96.55	21.73	96.66	22.71	95.26	20.85	97.22
July	27.47	97.16	22.09	97.35	21.92	97.47	22.89	96.01	21.06	98.20
August	27.17	96.08	22.23	97.98	22.10	98.31	23.19	97.28	21.11	98.43
September	25.41	89.85	22.45	98.95	22.34	99.35	23.30	97.74	21.42	99.86
October	28.49	100.76	23.75	104.67	23.66	105.24	25.05	105.08	22.83	106.41
November	30.30	107.17	24.35	107.30	24.24	107.80	25.46	106.80	22.91	106.83
December	30.93	109.39	24.75	109.08	24.56	109.25	26.26	110.14	23.07	107.54
Annual Average	28.27	100.00	22.69	100.00	22.48	100.00	23.84	100.00	21.45	100.00

Price stability

Price stability refers to the minimization of price fluctuation in the long run. This needs to minimize price risk for the benefit of farmers as well as traders. The level of price stability could be measured through coefficient of variation (CV). This indicates percentage change in the price compared to the mean price. If the values of CV decline over time this ensures price stability in the market. The values of CV are given in Table 4. Accordingly, values fluctuate indicating that there is no marked improvement in the price stability in the long run. As shown in the Table 04, price stability could be seen in 1993,1994 and 1999 while high price instability was registered during the period 1996-98 where the many millers and collectors left the business incurring losses due to price uncertainty.

Price spread

The price difference between producer, wholesaler and retailer refers to price spread. The difference between retail and producer price is defined as gross margin. Table 05 depicts the gross margin for rice for the period 1996-1999. It has increased over the years. This can happen due to increased value addition such as packing, trader's net margin and marketing cost. The visible reason for high marketing cost is increased marketing cost such as electricity and taxes including defense levy and national security tax. The end result is that farmer's share in the consumer price is declined to 45 percent in 2000 from 65 percent in 1996 during the Maha harvest period. It was also observed that traders increased their margins during the harvesting period.

Table 04. Coefficient of Variation for Paddy and Rice.

	Samba			*Nadu*			*Raw Red*			*Raw White*		
Year	*Produce Price*	*Wholesale Price*	*Retail Price*	*Producer Price*	*Wholesale Price*	*Retail Price*	*Producer Price*	*Wholesale Price*	*Retail Price*	*Producer Price*	*Wholesale Price*	*Retail Price*
1991	14.46	12.27	13.27	14.52	11.30	9.94	Na	11.50	9.63	Na	9.00	6.58
1992	8.70	8.87	6.11	10.38	8.16	6.27	Na	8.70	7.78	NA	5.85	4.64
1993	6.99	8.71	6.43	9.84	10.40	7.60	NA	10.09	9.48	NA	8.15	5.08
1994	8.41	11.06	8.65	7.46	9.82	7.73	8.04	7.05	5.55	9.02	7.38	4.81
1995	9.54	9.03	6.99	7.13	8.54	6.31	10.83	8.98	6.82	9.34	7.29	4.53
1996	13.05	10.31	7.66	14.44	10.49	9.28	15.03	14.48	12.78	13.53	11.31	9.88
1997	7.44	6.62	5.20	13.77	14.55	10.90	11.15	14.48	12.78	13.78	14.79	11.80
1998	10.73	7.64	6.09	10.07	10.22	9.56	12.63	13.36	10.50	12.77	10.90	9.83
1999	5.58	6.42	5.36	5.66	5.91	4.72	3.97	3.30	3.44	6.15	5.72	4.42

Source : Computed From MFPD/HARTI Data

Table 05. Gross Marketing Margin (Rs/Kg).

Varieties	*1996*	*1997*	*1998*	*1999*	*2000**
Samba	10.09	11.33	12.75	13.53	14.09
Nadu	6.70	7.42	9.25	10.33	10.04
Raw Red	4.48	6.25	6.80	7.64	7.72
Raw White	3.75	4.85	5.98	7.60	6.50

** Up to October 2000*

In 1999 millers increased mark up to 55 percent in February and 59 percent in April compared to 38 percent in January (Table 06). (Mark up means percentage add to the purchasing price to determine selling price). Similarly, retailers increased to 19 percent in March from 15 percent in January in 1999. This impact on farm income is significant because farmers sell bulk of the paddy during the harvesting period.

Price determination

In theory, price is determined by demand and supply in a competitive market. In case of many agricultural commodities demand is stable in the short run and hence supply is the major factor determining prices. When paddy/ rice marketing system is considered, three types of markets could be identified: producer (assembly), wholesale and retail. It is assumed that paddy prices influence wholesale price and wholesale prices influence retail prices. Accordingly, wholesale price was regressed on producer price and retail price was regressed on wholesale price. Results are given in Table 07. Over 80 percent of the variation in wholesale price of nadu and raw white is explained by producer price. Similarly, about 90 percent of the variation of retail price are explained by wholesale price. All the values of the regression coefficients are less than one indicating that if one percent changes in producer price wholesale price of rice would change less than one percent and if one percent change in wholesale price, retail price would change less than one percent.

This means that change in price in one market does not reflect fully in other market. The reason is that traders do not adopt the constant margin mechanism.

Table 06. Price Mark Up as Percentage of Buying Price.

Year	Samba		Nadu		Raw Red		Raw White	
	Wholesale	Retail	Wholesale	Retail	Wholesale	Retail	Wholesale	Retail
1995	55.22	13.73	38.7	22.92	17.1	17.95	14.08	18.7
1996	45.18	10.06	29.62	20.41	12.05	11.05	9.6	12.06
1997	49.42	10.02	32.54	13.55	12.05	11.05	15.24	12.06
1998	58.9	11.09	42.87	22.64	16.73	16.54	15.55	16.17
1999	52.6	11.82	39.38	17.42	18.22	14.11	20.66	15.28
2000*	63.13	13.23	44.55	21.36	19.56	17.14	15.34	21.42
Average	54.07	11.66	37.94	19.72	15.95	14.64	15.08	15.95

* Up to October 2000

Table 07. Regression Analysis.

P_w	=	0.45 (8.374)	+	0.86 P_r (16.139)	R^2	=	0.83	- Nadu
P_w	=	0.25 (3.875)	+	0.99 P_r (16.595)	R^2	=	0.86	- Raw White
P_w	=	0.44 (5.422)	+	0.82 P_r (11.036)	R^2	=	0.73	- Raw Red
P_w	=	0.67	+	0.71 P_r	R^2	=	0.70	- Samba
P_r	=	0.284 (4.273)	+	0.87 P_w (20.797)	R^2	=	0.89	- Nadu
P_r	=	0.162 (2.734)	+	0.92 P_w (20.088)	R^2	=	0.90	- Raw White
P_r	=	0.217 (3.932)	+	0.88 P_w (21.453)	R^2	=	0.91	- Raw Red
P_r	=	0.188 (3.770)	+	0.90 P_w (25.775)	R^2	=	0.93	- Samba

P_w = Wholesale price at Pettah

P_f = Producer price of paddy in major paddy purchasing areas

P_r = Retail price in Colombo and Suburbs

(T. Value is given in the Parenthesis)

Pricing efficiency

Correlation analysis is applied to test pricing efficiency in paddy and rice marketing. Few markets are selected for the analysis. Results are given in Table 08. All the values of correlation coefficient are close to one meaning that markets are integrated. This means that pricing efficiency exists in these markets. The formal and informal price information contributed to enhance pricing efficiency.

Table 08. Values of Correlation Coefficient Wholesale Price.

Samba

Location	*Colombo*	*H'Tota*	*K'Gala*	*Kandy*	*P'Ruwa*	*M'Mula*	*A'Pura*
Colombo	1.00	0.92	0.96	0.96	0.94	0.96	0.95
H'Tota	0.92	1.00	0.92	0.90	0.89	0.87	0.90
K'Gala	0.96	0.92	1.00	0.97	0.96	0.96	0.96
Kandy	0.96	0.90	0.97	1.00	0.95	0.96	0.96
P'Ruwa	0.94	0.89	0.96	0.95	1.00	0.97	0.96
M'Mula	0.96	0.87	0.96	0.96	0.97	1.00	0.96
A'Pura	0.95	0.90	0.96	0.96	0.96	0.96	1.00

Nadu

Location	*Colombo*	*H'Tota*	*K'Gala*	*Kandy*	*P'Ruwa*	*M'Mula*	*A'Pura*
Colombo	1.00	0.49	0.93	0.97	0.97	0.98	0.97
H'Tota	0.49	1.00	0.53	0.35	0.34	0.51	0.54
K'Gala	0.93	0.53	1.00	0.88	0.90	0.94	0.92
Kandy	0.97	0.35	0.88	1.00	0.98	0.97	0.94
P'Ruwa	0.97	0.34	0.90	0.98	1.00	0.96	0.93
M'Mula	0.98	0.51	0.94	0.97	0.96	1.00	0.97
A'Pura	0.97	0.54	0.92	0.94	0.93	0.97	1.00

Raw Red

Location	*Colombo*	*H'Tota*	*K'Gala*	*Kandy*	*P'Ruwa*	*M'Mula*	*A'Pura*
Colombo	1.00	0.93	0.95	0.96	0.96	0.97	0.96
H'Tota	0.93	1.00	0.89	0.95	0.95	0.94	0.93
K'Gala	0.95	0.89	1.00	0.93	0.94	0.95	0.95
Kandy	0.96	0.95	0.93	1.00	0.96	0.96	0.94
P'Ruwa	0.96	0.95	0.94	0.96	1.00	0.97	0.94
M'Mula	0.97	0.94	0.95	0.96	0.97	1.00	0.95
A'Pura	0.96	0.93	0.95	0.94	0.94	0.95	1.00

Raw White

Location	*Colombo*	*H'Tota*	*K'Gala*	*Kandy*	*P'Ruwa*	*M'Mula*	*A'Pura*
Colombo	1.00	0.98	0.93	0.98	0.97	0.94	0.95
H'Tota	0.98	1.00	0.93	0.97	0.97	0.94	0.93
K'Gala	0.93	0.93	1.00	0.90	0.94	0.89	0.94
Kandy	0.98	0.97	0.90	1.00	0.96	0.94	0.93
P'Ruwa	0.97	0.97	0.94	0.96	1.00	0.94	0.95
M'Mula	0.94	0.94	0.89	0.94	0.94	1.00	0.90
A'Pura	0.95	0.93	0.94	0.93	0.95	0.90	1.00

CONCLUSIONS

- Paddy/rice marketing sub sector is considered as a crucial area in the economy because its impact on farm incomes, consumer expenditure and nutrition is significant.
- Marketing structure has undergone changes after introduction of open economic policies, which enhance the competition in the market. Marketing channels have expanded.
- Many marketing activities have been developed. Both buying and selling activities have been improved. Seller and buyer relationship has been established in many areas. Cheating farmers by adopting underweight or paying low prices has minimized. Improvement of transportation has facilitated to establish direct links between production areas and consumption areas by passing terminal markets such as Colombo. However, paddy processing has not yet developed and investment on modernization of rice mills is very slow. Market rules and regulations appear to be inadequate and implementation of existing rules and regulation is weak. Market research is inadequate. Marketing credit has not given due attention as production.
- Price trend analysis indicates that real price of paddy and rice is on the decline indicating farmers real incomes dropped. Even nominal prices for nadu dropped continuously during the period 1993- 95.
- Seasonal price variation indicates that both paddy and rice prices remain at low level during the period March to September due to Maha production but the drop in paddy prices during the Yala harvest time could not be seen due to competition in the market as a result of speculative demand. It further reveals that paddy prices dropped faster than wholesale and retail price. This is due to maintaining relatively high margins both by millers and retailers. This curtails farm incomes.

- Gross marketing margins has increased and hence farmer's share in the consumer price has declined. This happened without much value addition, which reflects that consumers were not benefited.
- Much of the change in wholesale price is due to change in producer price. Similarly, over 90 percent change in retail price is due to change in wholesale price.
- Markets are integrated showing that pricing efficiency exists.

RECOMMENDATIONS

The future of the paddy farming depends upon success in marketing because marketing environment is today competitive. National Farmers Union (NFU) in England pointed out in 1994 that the success in agricultural marketing depends on four key objectives.

1. Strong marketing structure,
2. Enhancement of operational competitiveness,
3. Closer relationship with customers,
4. The development of a positive image for farm products.

The following recommendations are made to meet the above objectives.

- Application of modern business techniques such as profit through satisfaction of consumer needs and wants, product differentiation, and concentration on price rather than product, is an essential because farmers are production oriented as well as traders are sales oriented.
- Formation of farmer groups is needed to apply modern business techniques at farm level. Co-operation by grouping together will enable farmers to supply required quantity of differentiated produce and to undertake product promotion activities.
- Vertical integration is required to reduce distribution cost. Efficient distribution must be an important issue because marketing is getting the right quantity to the customer at the right time, at the right place and at the right price.
- Marketing research should be a continues process because marketing is a dynamic process. Micro research is required to understand the behaviour of food consumers and to study the marketing behaviour of farmers and agri-business farms. Similarly, macro research is needed to study marketing margins, to conduct price analysis and to ascertain impact of macro economic policies on paddy/rice marketing.
- Existing marketing rules and regulations should be revised, updated and new regulations should be formulated to ensure efficient and effective marketing system.

Enforcement of rules and regulations are equally important because many rules and regulations are only in the books.

- Improvements of market intelligence service implemented by HARTI should be improved. Market information system (MIS) should be expanded by adding information on production, stocks, market arrivals and internal market situation. Market news service (MNS) is required to be access to information. Similarly, Marketing extension system (MES) should be introduced to the present extension system. Further Marketing advisory service (MAS) is needed to advise the government on policy issues.

- Government incentives are required to develop marketing activities such as storage and processing. A part of the construction of paddy stores and modernization of rice mills should be born by the government. Indian government subsidizes 75 percent of the construction cost of micro irrigation.

- It is an urgent need to correct consumer biased trade policy on rice. At present rice prices are kept low making available imported rice at a low price through import duty adjustments. As such relative price of paddy/rice remains low generating may hardships for farmers.

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CHAPTER 6

INFRASTRUCTURE AND INSTITUTIONAL DEVELOPMENT