The Socio Economic Status, Channel Choice and the Perception of Paddy Farmers' Links to the Public and Private Marketing Channels in Sri Lanka

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FOREWORD

At HARTI, our mandate is to explore avenues for supporting the development in the agrarian communities. Paddy farmers constitute the majority of our stakeholders and it is our duty to undertake research for profitability of paddy farming which includes paddy marketing as well. Further, we need to ensure that the consumer is protected from undue price fluctuations in the market for this staple food crop. The major objective of this study was to examine the Socio Economic Status and the perception of paddy farmers' links to the public and private marketing channels in Sri Lanka. The study has also examined the influencing factors for the choice of marketing channels by the farmers. One of the main focuses of the national economic policy of the government is to develop agriculture through the use of advanced technologies. Agrarian communities view the paddy farming as a symbol of the dignity in rural sector.

A better marketing system oriented on digital platform is expected to stimulate the agricultural production to increase the capacity to feed the growing population. At the same time meeting the needs of consumers should be considered along with the allocating scarce resources more efficiently. Increasing market participation among smallholder paddy farmers have the potential to lift them to better income levels through increased productivity and surplus production. In order to sustain the livelihood of the small scale paddy farmers the study suggests valuable policy recommendations as short term and long term basis. I congratulate the coordinator Mr. W.A. Nalaka Wijesooriya and the research team for successfully undertaking this study and hope that the findings and recommendations of the study would be useful to policy makers and researchers in the agrarian sector.

Professor Ranjith Premalal de Silva
Director/CEO

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EXECUTIVE SUMMERY

The dominant sector of the Sri Lankan economy historically has been paddy (*Orayza sativa*) cultivation. Our ancestors made the country the Granary of the East. The civilization has been shaped and grown from paddy cultivation and it is the main contributor to the rural economy, as the majority of rural households are engaged in rice production as their main or supplementary source of livelihood. The relationship between Sri Lankan life and paddy cultivation is closely knit, that it permeates all aspects of Sri Lankan culture and history. Paddy sector plays a vital role in the economy of Sri Lanka by providing livelihood to nearly 0.9 million farmer families island wide. While 26 per cent of the labour force in the country is engaged in agriculture related activities and about a half of it is involved in the paddy/rice industry.

The Household Income and Expenditure Survey of the Department of Census and Statistics revealed that the expenditure on rice as a percentage of total food expenditure in 2006/07, 2009/10, 2012/13 and 2016 was 13.9, 17.3, 13.6 and 12.5 percent respectively. Paddy/rice industry has now become an important issue and it has also become politicized. During the harvesting season, farm gate prices declined drastically and in the off season high prices were recorded. Hence, this situation affected both the farmers and the consumers unfavorably. In order to prevent this adverse fluctuations, the government intervenes in paddy marketing mainly through the Paddy Marketing Board and also by encouraging the private sector. Marketing plays a critical role in meeting the overall goals of food security, poverty alleviation in the country and in agribusiness, profitability critically depends on the marketing channel choice. It is necessary to examine the farmer's decision making process in selling paddy and the other implications involved. The major objective of this study is to examine the socio economic status and the perception of paddy farmers' links to the public and private marketing channels in Sri Lanka. The study also examines the influencing factors for the choice of marketing channels by the farmers.

Both qualitative and quantitative data was collected through primary and secondary sources as appropriate. Main primary data collection tools were sample survey of the farmers, key informant interviewing with officials and focus group discussions with the members of the farmer organizations. Multi stage random sampling technique was applied in selecting farmers for the questionnaire survey. According to the nature of marketable surplus of the paddy 345 of sample farmers were selected from DS divisions in Ampara, Anuradhapura, Polonnaruwa and Batticaloa major paddy producing districts of the country. Farmers were divided mainly into two groups as those who sell paddy to the government (PMB) and others to the private sector. The average paddy land cultivated in the *Maha* season in Anuradhapura, Ampara, Polonnaruwa and Batticaloa is 3.41 ac, 3.50 ac, 3.09 ac and 4.80 acers respectively.

Out of the total sample (n = 345), nearly half of the farmers (48%) entirely depended on private sector paddy purchasing schemes. Nearly 52% of the sample farmers selling

their paddy to the PMB shows popularity of the government purchasing programme in major producing areas.

The logistic regression analysis indicated that the distance to paddy marketing board purchasing center has reported positive values, thus affected positively and significantly for the selection of Government Paddy Purchasing Programme (GPPP). Positive significant coefficient of 'Distance to paddy marketing board center' reflects that, even if a selected farmer is residing far from the PMB center, he or she is more inclined to select GPPP. This is mainly because the price gap between the open farm gate price and price offered by the PMB centers are comparatively different in peak harvesting months like February to March. PMB centers offer more price premium than in the open market and in some cases this was more than Rs.10.00/kg. Therefore, regardless of distance, farmers tend to select the PMB stores. In present study, "Quantity of wet paddy sold" is the variable which indicates a negative and significant impact on selecting GPPP. It means if a particular farmer tended to sell higher quantity of paddy as 'wet paddy' he or she is less likely to select GPPP. As explained above, farmers who do not have safe storage facilities, difficulties in finding a suitable place and the required labour to dry the paddy up to 14% moisture level and the farmers who have immediate cash needs are more inclined towards selling paddy to private buyers without drying at the paddy fields. On the other hand, farmers who sell less quantity of their harvest as wet paddy are more likely to select GPPP over private purchasing channels due to price premium that they can enjoy by selling to PMB centers. In addition to that, the average lowland land extent for farmers, is negatively significant. This means when the average land extent is lesser, the farmers tend to opt the PMB centers. In general, PMB centers purchase only 2,500 kg of paddy from a farmer. This also results in small scale low land farmers selling their paddy to the government channels. This means that there are more opportunities in government paddy purchasing channel for small scale farmers who produce limited surplus of paddy.

The study also found that, 40% of the farmers have obtained any type of loan for agricultural purposes. This indicates the indebtedness level and credit binding nature of paddy farmers. Generally, farmers who have difficulties in finding safe storage facilities, suitable places and required labour to dry paddy up to the standard level and those who have immediate cash needs to settle credits are more likely to give their first preference to the private sector. Further large scale farmers too show a tendency to sell their paddy to the private sector.

Research during the last three decades found that the farm income of paddy farmers deteriorated over time mainly due to the continuous rise of production cost, low paddy prices and a significant increase in the prices of consumer goods over time. This has resulted in a decline of living standards and the wellbeing of the farmers. The present study also found that the income of the majority of paddy farmers especially in Ampara district was not satisfactory.

Wasting time and money, ineffective buying process, strict quality checks of paddy, lack of sufficient storage facilities, delaying of the commencement of purchasing and lack of drying facilities are the major problems faced by the farmers when selling paddy to the government PMB centers.

The major problem highlighted by the farmers regarding selling paddy to private sector is inability to receive a fair price. Farmers point out that the private sector attempts to purchase paddy at low prices as much as possible especially in the harvesting season. This situation was highly stated by the farmers in Anuradhapura and Ampara districts. Another problem is the farmers getting cheated by traders. The farmers mentioned that the collectors and millers use fraud measuring devises. Nearly 70% of the farmers who select private channels sold paddy to local or outside millers.

More than 50% of the farmers are not satisfied and disagree with the present existing private sector dominated public sector intervening paddy purchasing system. Farmers empathized the need of a village level agent mechanism to sell their paddy to PMB. Farmers are highly satisfied with the suggested dual Guaranteed Pricing method based on paddy quality. They are also highly satisfied with the extension of present Ware House Receipt Financing Method in all major producing areas.

As short term the Guaranteed Price of paddy should be increased up to Rs 50.00/Kg or more to improve the income and well-being of paddy farmers. It is a long term need to create both agricultural and nonagricultural opportunities in main prominent paddy farming rural DS division areas especially in Ampara and Batticaloa districts. For example, the proposed export oriented Sweden based Agro Pharmaceutical Product Manufacturing Industry (Starch Industries (Pvt) Ltd) using organic manioc in Welikanda area in Polonnaruwa district will create more cash income and other agricultural opportunities for a large number of farmers. In addition, establishment of nonagricultural industries like export oriented garment manufacturing should be focused in these areas. Those measures contribute to enhance the economy of paddy farming households.

The application of Information Communication Technology (ICT), should be promoted so as to enhance the efficiency of PMB paddy purchasing and distribution programme. As an initiative, creating a website and feeding the farmers information into that website can be done. Using ICT in all storage transactions and will mitigate the leakages and diversion of funds and enhance efficiency. Lessons can be learnt from paddy procurement programme of Chhattisgarh State Government of India. Implementing drying yard facilities in procurement centers would help procure paddy just after harvesting.

The newly introduced warehouse marketing receipt system shows promising results therefore, can be promoted. Information sharing is of paramount importance to the

proper functioning of this Ware House Receipt System (WHRM). Warehouses should offer the price, supply and demand information to the market users so as to develop selling and buying strategies. Therefore, the establishment of a robust system for sharing of information, is necessary in presently operated warehouses like those at Anuradhapura and Mannar to enhance the efficiency of the system. Due to wild elephant threats the farmers in these areas tend to sell the paddy soon after harvesting without keeping it stored. This situation can be avoided by promoting WHRM system through which the farmers are provided safe storage away from their houses. Similarly, the government should encourage modern private sector mills in major paddy surplus producing rural areas especially in Ampara, Batticaloa and Anuradhapura. The medium scale success millers should be encourage to upgrade their milling industry especially in above mentioned surplus areas. This would lead to enhance the quality of paddy, livelihood of paddy farming community as well as to reduce market distortion.

A monitoring mechanism of producer prices of paddy at Divisional Secretariat (DS) level especially during the peak harvesting season needs to be established. Installing drying yard facilities in procurement centers would help procure paddy soon after harvesting. Duration of procurement period should be increased. In addition, a mechanism to provide quality drying yards at farm level with prioritizing the deserving areas. For this purpose, the private sector can also be encouraged. Therefore, steps should be taken to implement these programmes through both public and private sectors.

Another viable solution is to re-assess the role of the present private sector led and public sector intervened paddy marketing system, which would lead to reform both public and the private sector involvements. At the same time more market based strategies like Ware House Receipt Marketing, Deficiency Price Payment System, Public Private Partnerships to reduce the financial burden to the government can be implemented.

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ABRIVIATIONS

ARPA	Agriculture Research & Production Assistants
ASC	Agrarian Services Center
ASD	Agrarian Services Divisions
CACP	Council for Agricultural Cost & Prices
CBSL	Central Bank of Sri Lanka
CWE	Cooperative Wholesale Establishment
DCS	Department of Census and Statistics
DS	Divisional Secretariat
FPS	Fair Price Shops
GDP	Gross Domestic Product
GP	Guaranteed Price
GPPP	Government Paddy Purchasing Programme
GPS	Guaranteed Price Scheme
HARTI	Hector Kobbekaduwa Research & Training Institute
HH	House Hold
HIES	House Hold Income & Expenditure Survey
ICT	Information & Communication Technology
IPS	Internal Price Scheme
IRRI	International Rice Research Institute
MSP	Minimum Support Price
PDS	Public Distribution System
PMB	Paddy Marketing Board
RDB	Regional Development Bank
WHRM	Ware House Receipt Marketing

CHAPTER ONE

Introduction

1.1 Research Background

Marketing plays a critical role in meeting the overall goals of food security, poverty alleviation and sustainable agriculture, particularly among the smallholder farmers in developing countries (Altshul, 1988). Rice is the staple food of nearly half of the world's population. About one billion households depend on rice cultivation for employment and their main source of livelihood (IRRI, 2012). Rice has played a key role in the historical development in many Asian countries and rice is mentioned in the scriptures of the ancient civilizations of Asia. Today, patterns of cultivation, marketing, and consumption of rice are changing faster than ever before. The key factors that affect the demand for rice are incomes, prices, population growth, and urbanization in different ways. As incomes rise, consumers tend to shift from standard-quality rice to high-quality rice. The political economy of rice is changing, and that shapes rice production and consumption. Most Asian governments still view rice as a strategic commodity because of its importance in the diet of the poor in employment and income generation of farmers. In view of its strategic and political importance, the rice sector has been subject to a number of policy interventions.

Agriculture has been the backbone of the Sri Lankan economy with one-third of the rural population depending on it. It contributes 7 % to the country's GDP and constitutes 26.1 % of the total employment (Central Bank of Sri Lanka, 2017). The dominant sector of the Sri Lankan economy historically has been paddy (*Orayza sativa*) cultivation. Its ancestors made the country the Granary of the East. Paddy is cultivated in almost all parts of the country, except at very high altitudes. It is the main contributor to the rural economy, as the majority of rural households are engaged in rice production as their main or supplementary source of livelihood. The relationship between Sri Lankan life and paddy cultivation is closely knit, that it permeates all aspects of Sri Lankan culture and history. After 2009 the country's paddy production gradually increased due to the increase of the contribution to the national production from the Eastern and Northern provinces as a result of the ending of the prolonged war. During the period of 2008-2015 the country was able to achieve self-sufficiency in rice and produce more than the requirement. In year 2015 paddy production of the country reached the highest level at ever 4.8 million metric tons.

The Household Income and Expenditure Survey (HIES) of the Department of Census and Statistics in 2012/13 revealed that the expenditure on rice as a percentage of total food expenditure in 2006/07, 2009/10, 2012/13 and 2016 was 13.9%, 17.3%, 13.6 % and 12.5 % respectively. The report also revealed that the average food ratio is 37.8% in Sri Lanka and the sectorial composition is 32.1% in urban, 39.2% in rural and 49.8 in estate. Among low income groups the percentage expenditure on rice was comparably higher. According to the HIES, s the annual per capita rice consumption was 103.7Kgs, 107.9 Kgs ,108.8 Kgs and 107.8Kgs and 107kgs in 1986/87, 2006/07, 2009/10, 2012/13 and 2016 respectively. It is clear that during the recent past, per capita consumption shows a degree of stability.

Rice is the basic grain consumed as a staple food in Sri Lanka. It is the only staple food grain, providing reasonable amount of food nutrients and nearly half of the calories in the Sri Lankans diet. Rice is the most important crop in Sri Lanka since it involves the majority of the farmers on one hand and almost all citizens are rice consumers on the other. The significance of this sector is such that the government goes all out for the furtherance of paddy farmers, by means of producing incentives, subsidies, credit and inputs at lower interest rates, insurance schemes and so on. However, the recent trends of increasing paddy production, stabilization of the domestic rice consumption and the increasing dynamism of rice processing and domestic markets call for a rethinking in terms of attitudes with regard to rice industry in Sri Lanka.

Rice industry is the bedrock of food security and the economic development of Sri Lanka as the agriculture sector dominates its economy. Promoting the marketing capability of the farmers especially the smallholders is the key challenge to face an increasing farm investment. The rice sector is indispensable and fluctuations in rice prices disturb the social stability, and this may be one reason why governments tend to intervene in the implications that are likely to unsettle the rice marketing networks in their countries. Historically, governments in the main rice-producing and consuming countries had favor policies that maintained stable prices for consumers in urban centers and provided subsidies to farmers (Hossain, 2004). Like most Asian governments, Sri Lanka still views rice as a strategic commodity because of its importance in the diet of the poor and as a source of income generation.

1.2 The Government Intervention in Paddy Marketing in Sri Lanka

The government policy intervention in paddy marketing in Sri Lanka mainly focuses on procurement of paddy, fixing and maintaining guaranteed prices (GP), stock management, grain distribution and disposal of paddy in order to stabilize the rice market. History of the government intervention in rice purchasing goes back to the Second World War period. During that period due to difficulties in importing rice, the British Government introduced the internal purchasing scheme (IPS) in 1942 to purchase rice from the farmers for equitable distribution to the nation. The IPS was made compulsory for the farmers after one year of its implementation because supply obtained from the farmers was inadequate to distribute to the nation under public distribution programme. Under the compulsory rule a farmer had to sell two bushels (41.74 kg) of rice in the *Maha* (major season) and one bushels of rice in the *Yala* (minor season) per acre to the government (Rupasena, 2006). This public distribution programme was also known as the universal rice - rationing scheme (RSS). Weerahewa (2004) explains that public distribution programme comprised consumer co-operative societies with an island-wide network of retail shops. RSS requirement was fulfilled with the domestic procurement and imports. This study also notes that in 1961 the government introduced Domestic Produce Purchasing and Storage Act for the purpose of strengthening the role of co-operative societies in marketing.

The IPS came to an end in February 1948, coinciding with Sri Lanka's Independence and the Marketing Commissioner was authorized to purchase rice (rough) at Rs.8.00 per bushel under a scheme known as Marketing of Home Grown Produce Programme. A special committee appointed by the government in 1948 recommended the implementation of a guaranteed price scheme for rice (rough) and a number of other crops. Accordingly, the government introduced the guaranteed price scheme for rice (GPS) in 1948. It was a voluntary scheme. Farmers were free to make a decision to sell either to the government at predetermined price or at the open market at prevailing price. The initial purpose of the GPS was to give an incentive to the producers in a form of income to pursue their farming. Until the Paddy Marketing Board (PMB) was set up in 1971, various Departments, such as the Department of Marketing Development, the Department of Agrarian Service and the Department of Co-operative Development operated the GPS. In view of this, guaranteed price was always put above the world price of rice before liberalization.

Under the Act number 14 of 1971, the Paddy Marketing Board, was established. This act allowed the PMB or their agents to have the sole authority in collecting paddy from the farmers, store, and process and distribute the milled rice to the Food Commissioner's Department (FCD) for distribution to the consumers under the rice rationing scheme through cooperatives. This procedure continued until the economy was liberalized in 1977 (Rupasena, 2006).

Table 1.1: Changes of Guaranteed Prices for Paddy (1977-2018)

Year	Certified Price (Rs/Kg)	Year	Certified Price (Rs/Kg)
1977	1.91	2001	12.50-13.50
1980	2.39	2002	13.50-14.50
1981	2.51	2003	13.50-14.50
1981	2.75	2004	14.50-15.50
1983	2.99	2005	15.50-16.50
1985	3.35	2006	15.50-16.50
1988	3.83	2007	16.50-17.50
1990	5.26	2008 *Maha Season*	20.00-22.00
1991	6.50	2008 *Yala season*	28.00-30.00
1993	7.42	2009	28.00-30.00
1994	7.42	2010	28.00-30.00
1995	7.42	2011	28.00-30.00
1996	7.42	2012	28.00-30.00
1997	7.42	2013	32.00-35.00
1998	7.42	2014	32.00-35.00
1999	7.42	2015	38.00-41.00
		2015-2018	38.00-41.00

Source: Annual Reports – PMB & CBSL

Monopoly power given to the PMB was only applied during the period 1973-75 when the price of rice in the world market increased considerably. The monopoly power was abolished in 1977 with economic reforms and the PMB intervention was limited to the period when open market prices dropped below the GPS.

After 1977, fixing the guaranteed price was based on the cost of production (COP) in principle and it became a floor price. When the market price is lower than GPS the government intervenes to stabilize the price. Although cost of production was a major determinant in fixing GPS it is not fixed on a regular basis in accordance with cost of production. There is no proper time for announcement of the GP (Rupasena, 2006). When India is taken into consideration, minimum support prices are fixed each year and those prices are announced prior to the commencement of the planting season by the Council of Agricultural Cost and Prices. During the liberalized period in Sri Lanka a guaranteed price remained unchanged for long periods as in 1993-1999, 2008-2012, and also 2015-2018 (Table 1.1). During these periods the Paddy Marketing Board mainly intervened in paddy marketing. The PMB intervention is described in detail in the next sub chapter. The paddy purchased by the government was converted to milled rice, and the distribution policy was another intervention during the post - liberalized period. From 1979 to 1989 food stamp scheme was adopted to distribute rice and other food items to the poor. In 1989 this scheme, was converted to *Janasaviya* [1]programme and in 1995 changed to *Samurdi*[2] programme. Under these schemes cooperative society outlets carried out the village level food distribution. During that period the paddy purchased by the PMB from the farmers was processed into rice and handed over to the Food Commissioner's Department to be released to the cooperative societies. After 2011 the purchased paddy was processed by the Cooperative Wholesale Establishment (CWE) through private sector millers and the rice was sold at concessionary prices at the CWE outlets. The government procurement of paddy as a percentage of production varied on different periods. During the periods of 1955-66, 1967-79, 1980-87 and 1988-95 the percentage was nearly 45, 28, 7 and less than 5 respectively. Since 1995 government purchases have been recorded as less than five percent in almost all the years.

In addition to purchasing and post stock management of paddy, the PMB maintained buffer stocks of paddy for emergency use. So far as the buffer stocking policy was concerned until 1993 the Food Department maintained buffer stocks of rice and had the monopoly power of rice importation. The government introduced forward trade agreements as market based intervention in order to develop the farmer-trader linkages in 1999 with the facilitation of the Central Bank of Sri Lanka. In this programme the buyers were often the rice millers in respective producing areas. With

[1] Government poverty alleviation programmes targeting poor, implemented in 1989
[2] Government poverty alleviation programmes targeting poor, implemented in 1995

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 got involved in purchasing paddy. They were the assembly agents, brokers, small operators and rice millers. These assemblers were the first buyers of paddy and were often referred to as collectors, some of whom were paddy producers, input suppliers, and grocery traders. Many paddy assemblers were located in the paddy producing areas and only a very few maintained stocks for want of money and storage facilities. These assembly agents distributed the stocks of paddy to the millers who were located in different parts of the country. Some of these millers maintain paddy stocks and mill it at a later stage. In terms of the credit policy, the government provided credit to the PMB and pledged loans to the private sector millers for paddy purchasing under the subsidized credit rates. Mainly two state banks and some private banks involved in the programme. The details of the production, marketable surplus and quantity purchased by the state sector during the period 2009 to 2016 are given in the Table 1.2. It is clear during the recent past the highest purchase of the state sector was recorded in 2015.

Table 1.2: Production (P), Marketable Surplus (MS) and Quantity Purchased of Paddy by the Government (Mt) by Seasons in Sri Lanka

Season/ Year	Production(P) Mt	Marketable Surplus(MS) Mt	MS as a % of P	Government Purchased Quantity (Mt)	Government Purchase as a % of Production	Government Purchase as a % of MS
2009/10 *Maha*	2,629,566	1,478,217	56	70,769	2.7	4.8
2010 *Yala*	1,559,493	641,530	41	111,729	7.2	17.4
2010/11 *Maha*	1,996,183	1,044,811	52	3469	0.2	0.3
2011 *Yala*	1,898,041	1,019,113	54	75,172	4.0	7.4
2011/12 *Maha*	2,716,960	1,722,426	63	115,786	4.3	6.7
2012 *Yala*	1,128,986	500,016	44	10,476	0.9	2.1
2012/13 *Maha*	2,846,276	1,832,429	64	138,650	4.9	7.6
2013 *Yala*	1,774,451	959,175	54	94,376	5.3	9.8
2013/14 *Maha*	2,235,851	1,272,257	57	4,563	0.2	0.4
2014 *Yala*	1,144,929	380,884	33	0	0.0	0.0
2014/15 *Maha*	2,876,987	1,886,321	66	160,569	5.6	8.5
2015 *Yala*	1,942,408	1,079,064	56	175,013	9.0	16.2
2015/16 *Maha*	2902693	-	-	131981	4.5	-
2016 *Yala*	1517392	-	-	25438	1.7	-

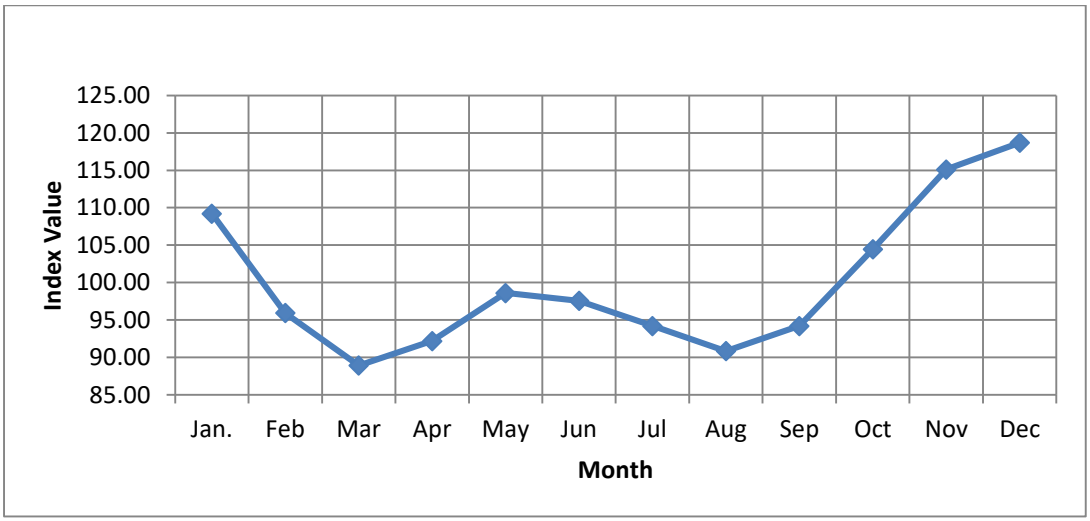
Note: MS = Net Production - (Wastage + Consumption + Seed requirement for next season)

Source: Calculated based on the data obtained from the paddy statistics of DCS & Annual Reports of the Ministry of Finance.

1.3 Justification of the Research

The government intervention in paddy/rice marketing system in order to stabilize the market is common in most of the rice producing countries in Asia. The type of intervention varies in the form of support prices for the farmers and fixing prices for the distribution of food grains to the consumers. The implementation of policy requires purchases or procurement from the farmers at pre-announced prices, stocking these food grains and distributing them either directly or through traders to the consumers.

Maintenance of the good quality paddy during long term storage has become one of the major concerns in food security, safety planning and marketing in most rice producing countries. Failure to comply with good storage management practices can jeopardize food supply to the needy population. The lesson learned from the rice shortage in 2008 coupled with rising population in the world, domestic prices and escalating cost of paddy production have made us wiser on how to handle this valuable commodity. The paddy production in the war affected areas like Batticaloa, Trincomalee, Ampara and Mannar increased significantly after 2009 when the war ended. The market equation of paddy started to change as a result of huge surplus reaching the market from those areas. The role of the marketing institutions became quite prominent to stabilize the market ever than before. The inter-annual fluctuation of long grain white (*Nadu*) paddy is shown in figure 01.



Source: HARTI

Figure 1.1: Seasonal Price Index of Long Grain White (*Nadu*) Paddy in Sri Lanka

According to seasonal variation rice prices marks an upward trend in the month of September every year and reaches the maximum by the end of December and then registers a declining trend, which continues at a rapid rate till March and at a lower rate till May (figure 1). The second phase of paddy price decline occurs in the months

of July and August with the *Yala* harvest. During December and January rice prices increases at unaffordable levels and it badly affects the urban consumers and other low income groups. In February and March paddy prices decline sharply and it badly affects the marginalized farmers. At present both paddy purchasing and rice processing are dominated by the private sector millers. According to the market economic theory, an efficient price is achieved at the point where demand and supply is in equilibrium in a competitive market situation. Therefore, a healthy competition of paddy and rice market is vital in order to protect the consumer as well as the producer.

According to the policies of successive governments considering paddy as the national crop it is envisaged ensuring a remunerative price to the paddy farmers in order to promote the sustainability of the agricultural sector. Any research conducted covering all major producing areas and the behavior of farmers who have joined the government channel is hard to get by. Also the new government policy is to continue the market oriented interventions like ware-house receipt marketing presently operated in Anuradhapura and Mannar.

1.4 Research Problem

Paddy/rice industry has now become a serious concern with all its multi-faceted implications, at times even affecting the social stability in the country. During the harvesting season farm gate prices decline drastically and in the off season it is the reverse. Hence, with this situation both the farmers and the consumers were badly affected. In order to prevent these adverse fluctuations, the government intervenes in paddy marketing mainly through the Paddy Marketing Board and encouraging the private sector. Some research exercises have brought to light that the terms of trade of paddy is unfavourable to the paddy farmers in Sri Lanka due to the continuous rise of production cost, low paddy prices and a significant increase in the prices of consumer goods (Wijetunga, 2011, Ahamed, 2014). In the circumstances, this study is concerned with examining the decision making process of the farmers in the disposal of their paddy harvest, problems they encounter and their suggestions to overcome these impediments so that their responses can be taken into account in future planning.

1.5 Objectives of the Study

1.5.1 The Broad Objective

To examine the socio economic status and the perception of paddy farmers' links to the public and private marketing channels in Sri Lanka.

1.5.2 The Specific Objectives

1. To examine the influencing factors affecting the disposal of paddy by the farmers either to the public channels or the private traders.

2. To identify the socio economic profile of the farmers and their links to the public and the private marketing channels.

3. To study the paddy farmers' perception on various types of interventions related to marketing of paddy.

4. To explore the problems encountered by the farmers in respect to each channel and identify the key policy initiatives needed to increase the efficiency of the public as well as the private sector intervention in paddy marketing.

1.6 Outline of the Report

Chapter I:
This chapter deals with the relevancy and scope of the research problem, objectives of the study and the background information on the study aspects.

Chapter II:
Provides a precise review of literature on historical and empirical views. It discusses factors influencing marketing channel choice by the farmers in developing countries particularly the major rice producing countries.

Chapter III:
Also describes in detail the research methodology employed in the study. It includes research design and data, sampling technique, study areas and the analytical framework.

Chapter IV:
Deals with the socio economic profile of the sample paddy farmers in major paddy producing districts. It also describes the relevant results obtained from the logistic regression analysis of data using analytical techniques and logical reasoning for results of the study.

Chapter V:
Describes the perception of farmers on different types of purchasing methods and interventions. The chapter further discusses the problems faced by the farmers in dealings with the public and the private marketing channels. The process of present warehouse receipt marketing system related to grain marketing is also brought under consideration.

Chapter VI:
Summarizes the findings, and indicates policy implications and recommendations.

CHAPTER TWO

Review of Literature

2.1 Introduction

This chapter is pre occupied with a discussion on the related literature about the concepts of the behaviors of marketing channel choice of the paddy farmers, the government and the private intervention in paddy marketing process and the economics of paddy marketing channels in Sri Lanka and trends in the recent past, the literature of which on paddy marketing illustrates the economics of paddy marketing and its effects.

2.2 Paddy Marketing Channel Choice

Marketing channel as defined by (Stern *et al*., 1996) is a set of interdependent organizations involved in the process of making a product or service available for consumption or use. Makhura (2001) claimed that the marketing of smallholder farmers is constrained by poor infrastructure, distance from the market, lack of own transportation and inadequate market information. Lack of bargaining power along with various credit bound relationships with the buyers has led to the farmers being exploited during the transaction where most of the farmers become price takers. The majority of the farmers are smallholders and hence, unable to obtain a fair price for their produce and resulting in not being able to sustain their livelihood (Xaba, 2012). The evidence found by Fafchamps and Hill (2005) discloses that the crop price received by the farmers varies between channels for sales, and this has implications for the welfare impact of commercialization. For the rural rice producers, marketing channel choice is one of the key ingredients to successful marketing of their products as different channels are characterized by different costs and profitability.

Sanjaya, (2011) studied the access to markets and farm efficiency: a study of rice farms in the Bicol Region, the Philippines. The study found that a significant inverse relationship between the distance from the market and farm productivity and efficiency. This finding suggests that the relationship between remoteness and farm outcomes has weakened over time. Study also found that the development of markets in the peripheral villages and the improved connectivity between the peripheral villages and market centers are facilitated by population growth, and infrastructural investments.

Cazzuffi & Mckay (2012) studied the rice market participation and channels of sale in rural Vietnam. Study find that larger scale of production and low transport costs are significant determinants of the probability of using more established channels of sale, such as traders or enterprises.

Soe et al (2015) studied the, factors influencing marketing channel choice by paddy farmers in Myanmar. The study found that there are restrictions in channel choices because of poor infrastructure, lack of marketing facilities, insufficient credit and the absence of up to date market information. Moreover, due to the unorganized oligopsony market structure individual marketing practices expose them to high transaction costs with low bargaining position. The majority of the farmers are unable to receive a fair price as they have to sell their products soon after harvest (high moisture paddy) when the price is generally low because of the immediate cash need for repayment of loans. So, the farmers cannot maximize profit which in turn affects the future investment of the paddy farmers. The study results show that the probability of selling at the farm gate increases with the distance to the market. The farmers who have storage, transportation, larger quantity and access to market information are more likely to sell to the remunerative direct marketing channels the rice mills. The results underscore the importance of forming farmers' organizations, development of marketing infrastructure, accessibility to up to date marketing information in order to support farmers bargaining power to develop their's profit and investment.

Rajinder et al (2015) studied the impact of government intervention in procurement of rice on smallholder farmers in Jammu Kashmir in India. The study found that the education is the only socio economic variable that affects the farmer's decision to sell the produce at the government procurement centres. Study also found that the intervention had thus ended the distress sale by the farmers, broken the monopoly of the private rice traders, mill groups and created competition. Esther (2016), studied the market participation by smallholder rice farmers in Tanzania. The study found that the decision to participate in the market is affected by the cropped area, yield, distance to the market and type of variety grown.

Mkali, (2016), studied the market integration of small scale rice farmers in Kilosa district, Tanzania. Study found that the age, distance to markets, quantity of rice produced and level of education were key factors that influence the choice of the marketing channel.

Premarathna, (2017) studied the farmer participation in paddy warehouse receipts financing system in Anuradhapura district. The study found that proper awareness of building activities are essential to introduce a paddy warehouse receipt financing system. At the same time, convenient travel distances for financial activities are needed to increase farmer participation.

Andrew (2010) and Karugia (2011), stated that, for smallholder farmers to access the market they need good marketing infrastructure. In Tanzania like in other developing countries, agricultural marketing infrastructure is still poor continually impeding the agricultural activities in the country. The key challenges are inadequate and poor conditions of the market facilities and transportation systems, including road and rail.

The road system, which is the most important for market development in terms of distribution of inputs and output to and from farms, is the most serious infrastructural bottleneck facing agricultural development in Tanzania (Temu et al., 2006 and Salami et al., 2010).

2.3 Government and Private Intervention on Paddy Marketing Process and Economics of Paddy Marketing Channels in Sri Lanka

Weerahewa (2004), revealed that the rice trade liberalization caused a drop in retail prices and increased the calorie intake and is a possible strategy to increase food security in Sri Lanka. However, it depresses producer prices reducing the income of the paddy producers. Study recommended that market reforms are needed to eliminate the market power exercised by middlemen and/or with mechanisms to increase the bargaining power of the farmers. Further, 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. Therefore, the study suggested that market reforms are needed to increase government intervention and have price support schemes to maintain competitive paddy prices to ensure the food security.

Rupasena (2006), pointed out that seasonal price fluctuation of rice reduced during the post-liberalization regime as compared with the pre-liberalization regime in Sri Lanka. This is due to the expansion of the private trade. Private traders, especially, millers purchase paddy at a low price at harvest time and hold stocks to release in the off- season.

Sabur et al (2003) studied the government paddy procurement programme in Bangladesh and they found that a positive relationship between the percentages of marketed surplus procured and the market price of paddy. Small farmers sold the highest proportion of their surplus to the procurement center in contrast to the large scale farmers. The cost of selling paddy to the procurement center was more than double the cost involved in selling paddy at the market. Study further described that the majority of millers were not satisfied with the size of quota received for *Boro* rice. The factors such as marketed surplus, experience, education, metaled roads and the distance of procurement center were found to influence the participation of farmers in the procurement programme. Study further stated that the major reasons for not selling paddy to the procurement center were the lengthy procedure, loss of time and high transportation cost. Economists stated that throughout the 1970s, 1980s and early 1990s, Indonesian policy of stabilizing rice prices was a classic and well documented example of the commodity price stabilization approach (Ellis, 1993, Falcon and Timmer, 1991, Pearson, 1993, Timmer, 1996 and Eleni et al., 2003). Through a parastatals agency called BULOG, Indonesia operated a buffer stock scheme that procured rice defending a floor producer price, and sold rice in the open market in order to defend a ceiling retail price. They found that the four key elements of the price stabilization approach were (1) intervening in terms of purchases only at the

margin of fluctuations in peak season volumes; (2) close monitoring of price trends and harvest predictions in areas where problems are likely; (3) relatively quick responses to changing local conditions; and (4) reliability and credibility of its purchase operations in defending a floor price.

Jha and Srinivasan (2006) indicated that a switch to decentralized public distribution system (PDS) and procurement and removal of rice levy in India leads to a fall in both procurement and buffer stocks of grains. The study concludes that the price support to farmers could be offered in the form of cash subsidy or deficiency payment.

Balani S (2013) described that India's public distribution system (PDS) is the largest distribution network of its kind in the World and it was introduced around World War II as a war-time rationing measure. Before the 1960s, distribution through PDS was generally dependent on imports of food grains. In 1997, the government launched the targeted public distribution system (TPDS), with a focus on the poor replacing the almost universal PDS. TPDS aims to provide subsidized food and fuel to the poor through a network of ration shops. Food grains such as rice and wheat that were provided under TPDS were procured from the farmers at a minimum support price (MSP) allocated to states and delivered to the ration shop where the beneficiary bought his entitlement. The Food Corporation of India (FCI) was responsible for; procuring grains at the MSP from farmers, maintaining operational and buffer stocks of grains to ensure food security, allocating grains to states, distributing and transporting grains to the state depots and selling the grains to states at the central issue price to be eventually passed on to the beneficiaries.

Table 2.1: Guaranteed Price of Paddy in India (Indian Rs/Kg)

Season	Common	Grade A
2015/16	14.10	14.50
2016/17	14.70	15.10
2017/18	15.50	15.90

Source: Authors' Commission for Agriculture Cost and Prices, Ministry of Agriculture in India, 2018

In India guaranteed price differs according to the quality of paddy (Table 2.1). The standards related to the normal paddy and grade "A" paddy are defined by the Commission of Agricultural Costs & Prices of India. According to the standards, Food Corporation of India (FCI) procures paddy from the farmers and the millers. The grading system encourages the farmers to produce quality paddy. And it was noted that the Commission of Agricultural Costs & Prices (CACP) of India announced the minimum support prices (MSP) prior to the beginning of every paddy cultivation season. The MSP was determined by the CACP using a very formal methodology by an expert panel consisting of eminent agricultural economists. Earlier there were many variables to consider calculating the MSP.

Gupta (2013), reviews the rice procurement operations of the Government of India from the standpoint of cost of procurement as well as effectiveness in supporting farmers' incomes. The two channels used for procuring rice are custom-milling of rice and levy. In the first, the government buys paddy directly from the farmers at the minimum support price (MSP) and gets it milled by private millers; while in the second, it purchases rice from private millers at a pre-announced levy price thus providing indirect price support to the farmers. Further, he reveals that although levy imposes a lower unit cost per quintal of paddy procured, over the last decade, custom-milling has become predominant, partly on the argument that it provides minimum price support to the farmers.

Soni et al (2013) studied the paddy procurement and distribution programme of Chhattisgarh, in India. Study found that the set of reforms initiated by the Government of Chhattisgarh for its purchase system of paddy through marketing societies by adopting a unique ICT based module to create a transparent and accountable delivery mechanism improved the efficiency of the programme. As a part of these reforms, the Government of Chhattisgarh in association with the National Informatics Centre has computerized its whole food grain supply chain - from procurement of produce, to storage and transportation, to state warehousing and further transfer to fair priced shops (FPS). To address the leakages in the purchase system, the State of Chhattisgarh implemented an end-to-end information technology solution in 2007. There is continuous monitoring of operations at all levels via reports uploaded onto the web in real time. Web management has led to enhanced accountability of operations. The online platform provides an account of commodity stocks which helps decision makers in utilizing the inventory of commodities with greater efficiency. A unique feature of paddy procurement in Chhattisgarh is the innovative for food security of poor and needy. Paddy procurement was computerized to bring in much needed transparency and efficiency. The ICT solution being used in Chhattisgarh is showing very encouraging results and states like Odisha, Uttar Pradesh and Madhya Pradesh have showed interest in rolling out a similar procedure.

Alam et al., (2014) described the nature of purchasing and distribution programme in Andra Pradesh of India. In Andra Pradesh Commission for Agricultural Costs and Prices (CACP) fixes support prices every year to safeguard the farmers and avoid distress sales. Food Corporation of India (FCI) is responsible for implementing MSP with the help of the states. The government is supposed to buy the entire paddy offered by the farmers for sale at the minimum support price. Procurement is operated through the millers. They purchase paddy from the farmers, then converted to rice and give to the FCI. The millers produce a certificate saying they gave minimum support price (MSP) to the farmer and gets MSP plus processing and transport costs. Procuring paddy from farmers through women self-help groups is a well-recognized system in the state. As a result, the farmers get the correct weight and the price. The payments are also made quickly. The system is apparently performing well.

2.4 Research in the Recent Past in Sri Lanka

Prasanna, et al (2011) explained in their study related to the paddy marketing conducted in the North Central Province that the poor returns of paddy farming is mainly due to the marketing issue and emphasized the need of better marketing practices for the paddy farmers. There are no adequate theoretical and empirical studies that have been undertaken to analyze the issue from the farmers' perspective. Samaratunga et al (2012), stated the government pricing policy has been successful in building up stocks, and the institutions have managed the stocks efficiently and those stocks have contributed for the price stability in Sri Lanka.

Study conducted by Ahamed (2014) in Sammanthurai area in Ampara district, stated that the mean expenditures of the paddy farmers exceed their mean income. Study also revealed that all the paddy farmer households have spent more than 50 percent of their total expenditure on food.

During the peak harvesting month more than 50 percent of the DS division's farm gate price of paddy was below the guaranteed price in many of the districts especially in Ampara and Batticaloa. Farm gate prices of all DS divisions in Ampara district were well below the guaranteed price in 2010 and 2013. The situation was more or less same in all major producing districts. Divisional Secretaries areas with regular low farm gate prices for paddy could be identified in all major producing districts (Wijesooriya, et al 2016).

Senanayake and Premaratne, (2016) conducted a paddy/rice value chain study in which the presence of several models of integration were found. Most of the small producers within the value chain worked together forming producer groups while large farms took a leading role in integration. The study suggested improving this integration model so that small farmers accrue benefits. In addition, the study suggested the need of a comprehensive survey prior to arriving at firm conclusions.

CHAPTER THREE

Methodology

3.1 Introduction

The chapter demonstrates the research design and data, survey design, sampling techniques, study area, sample size, data collection methods and analysis. Further, under analytical framework it explains the independent variables and their unit of measurements that has been applied in the logistic regression function.

3.2 Research Design and Data

The study is based on both primary and secondary data. In line with the objectives of the study, the methods of data collection consist of major components including a comprehensive literature review, a questionnaire survey for the farmers and discussions with key informants like private sector buyers, farmer organization leaders, bank officers, other input services providers, rural community leaders, and government officers.

Secondary data comprises a comprehensive literature review based on main concepts related to the study such as the behaviours of marketing channel choice of the paddy farmers, government and private intervention on the paddy marketing process and economics of paddy marketing channels in Sri Lanka and trends in the recent past. Furthermore, secondary data was collected from the Central Bank reports, annual reports of the Paddy Marketing Board, various survey reports published by the Department of Census and Statistics, progress reports of WHRM, relevant books and journals, HARTI weekly and monthly bulletins and HARTI price data base.

3.3 Survey Design

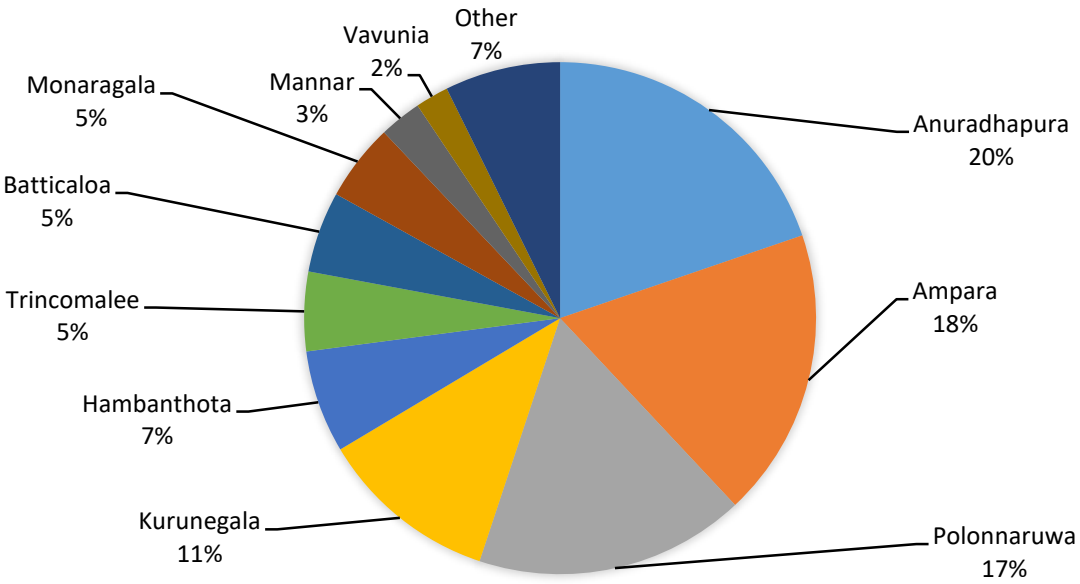
3.3.1 Study Areas

For the collection of primary data from farmers, Ampara, Anuradhapura, Polonnaruwa, and Baticaloe districts were selected according to the distribution of marketable surplus of paddy in major producing areas in the country. As the first step, districts to conduct the sample survey were identified based on the district - wise figures of paddy marketable surplus of the country in an average production year (Table 3.1 & Figure 3.1). Nearly 75% of paddy marketable surplus is being reached to the market from Ampara, Anuradhapura, Polonnaruwa and Batticaloa. Therefore, this study mainly focused on those four areas.

Table 3.1: Generation of Paddy Marketable Surplus: District - wise Figures in an average production year, 2013

District	Percentage of Paddy Surplus	Rank
Anuradhapura	20	1
Ampara	18	2
Polonnaruwa	17	3
Kurunegala	11	4
Hambanthota	7	4
Batticaloa	5	5
Trincomalee	5	6
Moneragala	5	7
Other Districts	12	8

Source: Authors' compilation based on data, Department of Census and Statistics



Source: Department of Census and Statistics

Figure 3.1: Annual Marketable Surplus of Paddy in Sri Lanka (%) in an Average Production Year, 2013

3.3.2 Sampling Technique

Multi-stage sampling technique was deployed to select respective DS Divisions and ASC Divisions. Paddy farming is the predominant livelihood of all DS Divisions and ASC Divisions in the above selected districts. The list of the farmers by districts was obtained from the Paddy Marketing Board and sample sizes were determined according to the number of farmers (who joined the government programme) and the

nature of surplus by the respective district. However, there was no any record of the farmers who selected private marketing channels. Therefore, those farmers were selected based on convenient sampling.

3.3.3 Sample Size

Total sample of the study was 345 and it was allocated proportionately according to the respective marketable surplus of paddy in each district mentioned earlier (Table 3.1).

Table 3.2: District-wise Sample Size

District	Sample Size
Ampara	140
Anuradhapura	95
Polonnaruwa	74
Battticaloe	36
Total	**345**

Source: HARTI survey data, 2017

From the total sample, 167 farmers were selected as those who depended on private channels and the rest (n=178) were those who relied on the public sector. At the initial stage it was decided to select more private sector farmers since their participation was relatively higher and this was also proven in the past studies as well. The highest ever paddy production in the history of the country was recorded in the year of 2015. Therefore, 2015 was chosen as the reference year and further 2016 and 2017 were failed years due to the prolonged drought. As a result of the highest paddy purchasing by the PMB was carried out in 2015. Hence, farmer representation of the PMB purchasing programme was higher compared with any other years. This resulted in the high representation of farmers from the government channel.

3.3.4 Data Collection Methods

Data collection was carried out in the months of August to December 2017. Primary data collection was carried out using a pre tested structured questionnaire survey for selected farmers. Furthermore, key informant interviews and focus group discussions were carried out with both farmer office bearers, farmer organizations and officials. Key informant interviews were conducted with Chief Manager - credit (Regional Development Bank), Manager - credit (Regional Development Bank), Managers of government grain warehouses - Anuradhapura and Mannar, respective Agrarian Development Divisional Officers (DOs), Store's Managers (Paddy Marketing Board) Agriculture Instructors (AIs), and Agriculture Research and Production Assistants (ARPSs) in the selected districts.

3.4 Analytical Framework

3.4.1 Model Specification

Market participation of smallholder paddy farmers is affected by numerous factors mainly including socio economic and market factors. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables. When the outcome of interest is a binary variable, logistic regression is appropriate (Ingram, 2003). In other words Binary logistic regression is useful where the dependent variable is dichotomous (e.g., succeed/fail, live/die, graduate/dropout, vote for A or B, sold trader A or trader B). A dependent variable is referred to as binary when it can take only two possible outcomes such as "yes (1)" and "no (0)." Dependent variable has two categories where, farmer who selected the GPPP as the marketing channel of his surplus paddy and the farmer who selected private channel. Independent variables can be one or more categorical or continuous variables. Therefore, in this study, a logistic regression analysis was employed to analyze the socio-economic factors that influence farmer's decision to select the government paddy purchasing programme as the marketing channel.

Social-demographic characteristics of the farmers play a very crucial role in either promoting or impending their participation in agricultural markets. In this sub-section, key social-demographic factors related to the market participation of paddy farmers are reviewed. Decisions to participate in either the public or the private markets or even not participating signify the individual direction to maximize utility. Logistic regression was used to analyze the farmers' decisions to participate in the public Paddy Marketing Board (PMB), or participate in other private market channels and the factors that influenced these choices. Present study attempts to explain the behavior of a dependent variable of a dichotomous nature, through various combinations of nineteen independent variables. In many of the choice studies, the dependent variable is random, which is constrained to lie between 0 and 1. In this context, maximum likelihood logistic regression has been recognized as a proper approach to get more precise estimates on choice/adoption in social science.

Maximum likelihood logistic regression has been a popular application in modeling nature of adoption. Kumar *et al*, (2010) have applied the maximum likelihood logistic regression model in evaluating characteristics and determinants of contract design of wheat seed farming in India. Further, Adeogun *et al.* (2008), has used the same model in measuring the level of adoption for inland fish farming in Nigeria. Sharma and Kumar, (2000) have applied the maximum likelihood logistic regression model in evaluating the factors influencing the taking on of agro forestry programme in North - West of India. Moreover, Karunagoda *et al*. (2010) has applied the maximum likelihood logistic regression to evaluate the factors affecting adoption of agricultural forward contacts in Sri Lanka.

The aim of the logistic regression is to find out the best fitting model to describe the relationship between dependent variable of dichotomous nature and a set of explanatory variables of independent variables, which is measured as continuous or categorical form. The model derived from the logistic functional form of the choice probabilities, which traces out an S-shaped curve. Further, it applies the maximum likelihood estimation after transferring the dependent into an odd ratio (the natural log of the odds of the dependent occurring or not) (Gujarati, 2005).

Therefore, the log likelihood method is applied instead of ordinary least square method because the dependent variable is binary, which means *Yi* takes the value of one if a farmer has selected government channel as one of the marketing channels for selling paddy or otherwise, the value of *Yi* is assumed as zero.

But, if *Y* is dichotomous dependent variable coded as *Y = 1* for the outcome of interest (denoted a "success"), and *Y* = 0 for the other possible outcome (denoted a "failure") and *Pi* to represent the probability that the "success" outcome occurs in the population. The probability of a "failure" outcome is then *1 - Pi*.
Model for the probability of a "success" outcome

$$\mathrm{Pi} = \beta_o + \beta_1 X = \mathrm{E}[Y]$$
$$\mathrm{Pi} = \text{Probability}$$

But, the usual regression assumption of normality of *Y* is not satisfied as *Y* is not continuous (it only takes a value of 0 or 1). Therefore, instead of fitting a model for *Pi*, model is fitted for log - transformed *Pi*.

$$\log e\left(\frac{\mathrm{Pi}}{1-\mathrm{Pi}}\right) = \frac{\mathrm{Pi(Sucess)}}{\mathrm{Pi(Failure)}} = \text{odd ratio}$$

The odds ratio in favour of choosing government channel as one of the marketing channels of paddy is the ratio of probability that a farmer will choose government paddy purchasing programme (GPPP), to the probability that he/she will select other available marketing channels, apart from government paddy purchasing programme (GPPP)

An empirical representation of choosing GPPP by farmer *i* to observable explanatory variables is given by equation 1.

$Yi = Xi\,\beta + \epsilon i$ ……..1

Where, Xi is the vector of explanatory variables relevant to farmer *i*'s choose of GPPP system. β is the vector of unknown parameters and ϵi is the residual error assumed normally distributed. In a binary log likelihood function, the log odd ratio expressed a linear function of the explanatory variables (equation 2,3)

$$\log e\left(\frac{\mathrm{Pi}}{1-\mathrm{Pi}}\right)=\beta_o+\sum_{j=1}^{k}\beta_j X_{ji} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

j = 0,1,2….n, where n is the total number of independent variables. X_{ji} is the j th explanatory variable of the i th observation. β_o is the constant and $\beta_{j's}$ are the coefficients of explanatory variables.

$$\ln\left(\frac{\mathrm{Pi}}{1-\mathrm{Pi}}\right)=\beta_o+\sum_{j=1}^{k}\beta_j X_{ji} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

The maximum likelihood logistic regression model for choosing government paddy purchasing programme was developed as follows;

Farmer who selected GPPP was given the value 1, while farmer who did otherwise was given 0. The predictor variables were derived based on the assumption that choosing GPPP is a function of range of farmer characteristics such as personal, resource related, income related, Indebtedness related and locality related variables.

Accordingly, it is predicted that personal characteristics such as age, level of education, having a secondary occupation and experience, have an impact in selecting the marketing channel. Next, resource related attributes such as highland extent, low land extent, family labour availability, availability of paddy storage facilities and having an own transport facility also might have some influence on the marketing channel choice. Further, predicted income related variables which have some effect over farmer's decision on choosing a marketing channel were Samurdhi recipient status, quantity of wet paddy sold, marketable surplus of paddy (*Maha* season), income from other field crops (*Yala* season) and Income from other field crops (*Maha* season). Indebtedness related variables were whether farmers have taken informal loans and whether they have pawed jewellery for agricultural purpose. Next, considered locality related variables were distance to PMB store (km), distance to private mill (km) and distance to private collector (km). The developed two models of the maximum likelihood logistic regression to analyze the adoption behavior of a selected farmer are: The details of the two models described under sub topic of 4.11 analysis part under the results and discussion chapter.

$$\ln\left(\frac{Pi}{1-Pi}\right)=\beta_o+\beta_1\mathrm{AG}+\beta_1\mathrm{EDU}+\beta_2\mathrm{SO}+\beta_1\mathrm{HE}+\beta_1\mathrm{EX}+\beta_1\mathrm{FL}+\beta\mathrm{SR}+\beta\mathrm{PS}+\beta\mathrm{DPMB}+\beta\mathrm{PJ}+\beta\mathrm{OT}+\beta\mathrm{MSP}---1$$

$$\ln\left(\frac{Pi}{1-Pi}\right)=\beta_o+\beta_1\mathrm{LE}+\beta_1\mathrm{PS}+\beta\mathrm{DPMB}+\beta\mathrm{DPM}+\beta\mathrm{DPWS}+\beta_1\mathrm{IL}+\beta\mathrm{QWP}-----2$$

Table 3.3: Descriptions of the Selected Variables Applied in the Logistic Regression Model

Variable	Level of measurement	Unit of measurement	Description
Select government purchasing channel or reject government channel (Dependent variable)	Ordinal	Binary	1 = Select GPPP 0 = Otherwise
Age (AG)	Ratio	Years	
Level of education (EDU)	Ordinal	Levels	1 = Below O/L 2 = Equal or above OL
Secondary occupation (SO)	Nominal	Binary	1= Yes 2= No
High land extent (HE)	Ratio	Ac.	
Low land extent (LE)	Ratio	Ac.	
Experience in paddy farming (EX)	Ratio	Years	
Family labour availability (FL)	Ratio	Number	
Samurdhi recipient status (SR)	Nominal	Binary	1= Yes 2= No
Availability of paddy storage facility (PS)	Nominal	Binary	1= Yes 2= No
Distance to paddy marketing board center (DPMB)	Ratio	Km	
Distance to private mill (DPM)	Ratio	Km	
Distance to private collector (DPC)	Ratio	Km	
Status of getting a loan from an informal source for agricultural purpose (IL)	Nominal	Binary	1= Yes 2= No
Pawning of jewelries for agricultural purpose (PJ)	Nominal	Binary	1= Yes 2= No
Having an own transport facility to transport paddy (OT)	Nominal	Binary	1= Yes 2= No
Quantity of wet paddy sold (QWP)	Ratio	Kg	
Marketable surplus of paddy (*Maha*) (MSP)	Ratio	Kg	
Income from other field crops (*Yala*) (IOFCY)	Ratio	Rs./Month	
Income from other field crops (*Maha*) (IOFCYM)	Ratio	Rs./Month	

Source: Source: HARTI survey data, 2017

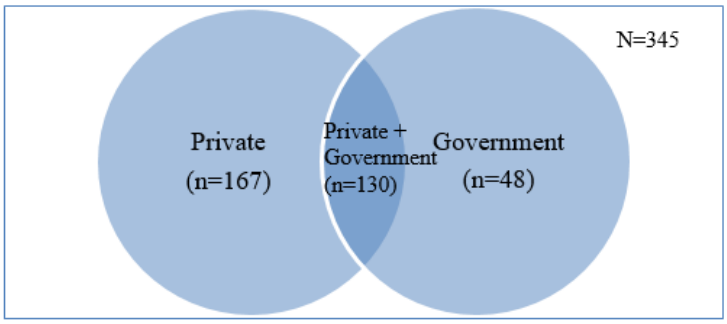
CHAPTER FOUR

Socio-Economic Status and Marketing Channel Choice of Paddy Farmers

This chapter deals with the socio economic profile of the sample paddy farmers' links to the public and private marketing channels in major paddy producing districts. The descriptive analysis also explains the variables like age, gender, land size, occupation, experience, and housing and *Samurdhi* status while the logistic regression analysis describes the channel choice behavior of paddy farmers. The chapter also provides the process of present warehouse receipt marketing system related to the grain marketing.

4.1 Nature of Farmer Population

Out of the total sample (n = 345), nearly half of the farmers (48%) depended on private sector paddy purchasing schemes, whereas the corresponding figure for the government sector was only 14% and those who selected both are 38% (Table 4.1). Randomly selected farmers' representation is as follows (Figure 4.1). According to the results there were 167 farmers who solely relied on the private marketing channels like the rice millers and the collectors. Only 48 farmers opted for the government marketing channels. This is mainly due to their selling quantity not exceeding 2,500kg which is the maximum limit of PMB purchasing quantity for a season per farmer. Furthermore, 130 farmers selected both the private and the government marketing channels. Their first choice was the PMB stores and the rest of the surplus sold out to the private sector. However, farmers who have selected both the private and the government channels were grouped into the government category in the analysis because their first choice was always with the government (PMB) center.



Source: Authors survey data, 2017

Figure 4.1: Graphical Representation of the Selected Sample

Having recorded the second highest marketable surplus of paddy, in Polonnaruwa nearly two third (72%) of the farmers relied on the private sector paddy purchasing schemes. Mainly due to larger number of paddy mill facilities maintained by the

private sector in Polonnaruwa district. Among the major paddy producing districts, Polonnaruwa has the highest and the largest distribution of rice mills and also, the major rice mills in the country are highly concentrated in the area. Hence, the situation of Polonnaruwa is comparatively different from that of other districts. However, in Batticaloa district 56% of the farmers relied on the private sector paddy purchasing schemes, whereas none entirely on the government sector. Among all the districts which have been selected, the highest farmer choice for the government paddy purchasing scheme was demonstrated in Ampara. Majority of the farmers (47%) in Anuradhapura have selected a combination of both the private and the government sector. From the total sample more than 80% of the farmers were male headed farmers and the rest female headed farmers (Table 4.2).

Table 4.1: Type of Farmer by District

Type of Farmer	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	41	39	56	72	48
Pvt. & Gvt.	47	36	44	23	38
Gvt.	12	25	-	5	14

Note: Pvt. – Farmers who sold paddy to private sector; Gvt. – Farmers who sold paddy to Government (PMB), Pvt. & Gvt. – both Private & Government.

Source: HARTI survey data, 2017

Majority of households are engaged in farming activities as their main occupation in Anuradhapura (75%); in Ampara (85%); in Batticaloa (94%) and in Polonnaruwa (91%) (Table 4.5). Therefore, choice of selecting the best purchasing channel is a vital decision for respondents in all the four districts. Interestingly, the highest percentages of households (50% in Batticaloa and 62% in Polonnaruwa) whose main income source was farming opted to the private sector paddy purchasing scheme as their first preference. On the contrary, in Anuradhapura and Ampara majority of the respondents who engaged in agriculture opted for the government paddy purchasing schemes. Therefore, it is clearly affirmed that the private sector intervention in paddy purchasing in Batticaloa and Polonnaruwa is relatively high.

Table 4.2: Distribution of Male & Female of HH

Type of Farmer	Gender	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	Female	12	6	11	9	9
	Male	29	33	44	62	39
Pvt. & Gvt.	Female	5	6	-	4	5
	Male	42	30	44	19	32
Gvt.	Female	2	5	-	1	3
	Male	9	20	-	4	12
Total	Female	19	17	11	15	17
	Male	81	83	89	85	83

Note: Pvt. – Private; Pvt. & Gvt. – Private & Government; Gvt. – Government
Source: HARTI survey data, 2017

4.2 Age Distribution

Majority (83%) of the sample consisted of male farmers (Table 4.2). Age category of the farmer is a vital factor when choosing a particular paddy purchasing scheme according to the reviewed of literature. However, results revealed that the average age of the two categories were equal and it was nearly 55 years. This demonstrates how differently age categories behave and select the best purchasing schemes according to their prior experience and awareness. From the total sample, 57% was in the age group of 40 years to 60 years and only 10% represented the age category of less than 40 years (Table 4.3). Among the farmers who have selected the government paddy purchasing schemes in Anuradhapura and Ampara only 1% was less than 40 years. Interestingly, none of the farmers in this category in both Batticaloa and Polonnaruwa has selected the government paddy purchasing schemes, indicates the reluctance of the young farmers towards the government paddy purchasing schemes.

Table 4.3: Distribution of Age of HH

Type of Farmer	Age	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	<40yrs	11	4	6	7	6
	40-60yrs	23	19	19	43	26
	>60yrs	7	16	31	22	17
Pvt. & Gvt.	<40yrs	7	1	3	1	3
	40-60yrs	29	25	25	16	24
	>60yrs	11	9	17	5	10
Gvt.	<40yrs	1	1	-	-	1
	40-60yrs	8	10	-	4	7
	>60yrs	2	14	-	1	6
Total	<40yrs	19	6	8	8	10
	40-60yrs	61	55	45	64	57
	>60yrs	20	39	47	28	33

Note: Pvt. – Private; Pvt. & Gvt. – Private & Government; Gvt. – Government
Source: HARTI survey data, 2018

Despite the presence of there were three paddy purchasing options namely: (i) the private sector; (ii) the private and the government sector and (iii) the government sector, for the analysis purpose of the sample is categorized mainly into two purchasing schemes namely; the private sector and the government and private sector (sub topic 4.1). It is noted that majority of the small farmer's scale not producing a considerable market surplus selected only the government paddy purchasing schemes. They fetched comparatively higher prices from the PMB stores. In general, the government imposed a ceiling of 2,500 kg of paddy from an individual farmer. Therefore, small scale farmers opted for the government schemes.

However, farmers who cultivate on a larger scale (nearly three or more acres) producing an adequate marketable surplus offer portion of their harvest to the government and the rest to the private sector. Hence, the first choice of these farmers is always bound with the government paddy purchasing schemes. As a result of the limited purchasing capacity of the government schemes, these farmers tend to sell the rest to the private channels. Therefore, both segment of the farmers who have selected those two channels could be categorized as those who rely on the government sector. Therefore, from now onward the 167 farmers who belongs to private sector depicted in figure 4.1 are considered as "Pvt "category. Further the farmers who belongs to private and government sector only government sector whose total number is 178 are considered as "Gvt" category.

Most of the time, farmers who demarcated their first preference as the private sector have credit binding with private parties. Leaving them with no option other than depend on the private channels. This is clearly visible in the Batticaloa district. Where

the government intervention in paddy purchasing is very limited and one large private sector paddy mill operates in the area which is known as "*Jegathees*" rice mill. It has a unique paddy purchasing model. Currently, it has over 500 registered farmer base. All the necessary inputs are provided to the farmers by the mill. In return, farmers are bound to sell their harvest to the mill which has links with the commercial input suppliers (e.g. CIC, Agstar etc.). More importantly, this mill is equipped with an up to date accurate weighing bridge as well as high volume driers which are not found in government sector institutes. This new technology may have lured the farmers for a better service at this mill.

4.3 Level of Education

Educational level influences the farmer choice of paddy purchasing schemes. Majority of the farmers have gone up to grade 6 to grade11: in Anuradhapura (49%); in Ampara (45%); in Batticaloa (36%) and in Polonnaruwa (38%) (Table 4.4). Only a very few (1%) were illiterate. This emphasizes that majority of the farmers were fortified with sufficient level of education to understand and select the best paddy purchasing schemes available. So far as the educational levels and the choice of the marketing channels are concerned, those farmers who have been successful at the O/L and A/L examinations could have selected the private sector paddy purchasing schemes are fewer than the farmers who opted for government purchasing schemes.

Table 4.4: Distribution of Education of HH

Type of Farmer	Education Level	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	Able to read & write	-	1	-	-	0
	Unable to read & write	-	2	-	4	2
	Grade 1-5	6	10	14	16	11
	Grade 6-11	19	15	22	27	19
	Passed O/L	8	9	11	12	10
	Passed A/L	7	2	8	11	6
	Graduate	-	1	-	-	-
	Diploma	-	-	-	1	-
	Total	41	39	56	72	48
Gvt.	Able to read & write	-	1	6	1	1
	Unable to read & write	-	1	3	-	1
	Grade 1-5	6	7	6	5	1
	Grade 6-11	31	30	14	11	6
	Passed O/L	11	16	11	9	24
	Passed A/L	12	5	6	1	12
	Graduate	-	1	-	-	6
	Diploma	-	-	-	1	-
	Total	59	61	44	28	52
Total	Able to read & write	-	1	6	1	1
	Unable to read & write	-	3	3	4	3
	Grade 1-5	13	17	19	22	17
	Grade 6-11	49	45	36	38	44
	Passed O/L	19	25	22	22	22
	Passed A/L	19	7	14	12	12
	Graduate	-	1	-	-	1
	Diploma	-	-	-	1	-

[3]Note: Pvt. – Private; Gvt. – Government

Source: HARTI survey data, 2017

[3] Pvt : Farmers who have selected only private sector Gvt : Farmers who have selected both the private and the government channels were grouped into the government category in the analysis because their first choice was always with the government (PMB) center.

4.4 Occupation

Majority of households are engaged in farming activities as their main occupation: in Anuradhapura (75%); in Ampara (85%); in Batticaloa (94%) and in Polonnaruwa (91%) (Table 4.5). Therefore, their preference in selecting the best purchasing channel is a vital decision for respondents in all four districts. Interestingly, the highest percentages of households (50% in Batticaloa and 62% in Polonnaruwa) whose main income source was farming opted for private sector paddy purchasing scheme as their first preference. On the contrary, in Anuradhapura and Ampara majority of respondents opted for government paddy purchasing schemes. Therefore, it is clearly proved that the private sector intervention in paddy purchasing in Batticaloa and Polonnaruwa is relatively high. The analysis found that there is no significant relationship between the occupation and the marketing channel choice.

Table 4.5: Distribution of Main Occupation of HH

Type of Farmer	Source of Income	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	Farming	33	34	53	62	41
	Other	8	6	3	9	5
Gvt.	Farming	42	51	44	28	43
	Other	16	9	-	-	8
Total	Farming	75	85	97	91	84
	Other	25	15	3	9	16

Note: Pvt. – Private; Gvt. – Government
Source: HARTI Survey Data, 2017

Primary income sources and non-agricultural activities are included under the category of “Other”. Those non-agricultural activities are comprised of government and private sector employment, foreign remittance, business activities, retirement and rearing livestock.

Table 4.6: Distribution of Secondary Occupation of HH

Type of Farmer	Source of Income	Anuradapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	No secondary Occupation	25	24	36	35	28
	Farming	9	10	3	8	9
	Other	6	5	8	27	39
Gvt.	No secondary Occupation	30	35	31	13	1
	Farming	18	16	-	-	11
	Other	10	10	14	15	12
Total	No secondary Occupation	56	60	67	49	53
	Farming	27	26	3	8	20
	Other	17	14	30	43	27

Note: Pvt. – Private; Gvt. – Government
Source: HARTI survey data, 2017

It was revealed that the majority of respondents (53%) did not have secondary income sources (Table 4.6). From the total sample 20% are engaged in farming as their secondary occupation. Other secondary income sources include, animal husbandry, labour, and skilled jobs like masonry, carpentry, self-employee and business activities. Interestingly, a higher percentage of respondents (11%) who selected government paddy purchasing schemes engaged in farming activities than farmers who selected private channels.

Table 4.7: Average Paddy Cultivated Extent by Type of Farmer, by Districts and by Season

Type of Farmer	Season	Anuradhapura		Ampara		Batticaloa		Polonnaruwa	
		No	Avg (Ac)	No	Avg	No	Avg	No	Avg
Pvt.	Maha	38	3.53	54	3.65	20	4.90	47	3.04
	Yala	27	2.56	57	3.39	16	4.50	49	2.73
Gvt.	Maha	57	3.33	85	3.41	16	4.70	27	3.19
	Yala	41	2.63	75	3.23	10	4.70	23	3.17
Total	Maha	95	3.41	139	3.50	36	4.80	74	3.09
	Yala	68	2.60	132	3.30	26	4.60	72	2.87

Note: Pvt. – Private; Gvt. – Government
Source: HARTI survey data, 2017

4.5 Cultivated Extent and Selling Behavior of Paddy

An average land extent of all districts in both seasons except Anuradhapura, has an almost equal contribution (Table 4.7) for the cultivation. It was revealed that the cultivated extent of paddy in *Maha* season ranged between 3.0 – 3.5 except Batticaloa. It is specific in this area that it average cultivated extent is greater than that of the other study areas. Interestingly, this average extent for *Maha* season in Batticaloa nearly 5.0 acres. According to the Department of Census and Statistics in 2002, quarter of the paddy farmers from the total in Batticaloa owned more than five acres of paddy land. Hence the results of the study, imply that situation this has continued to come down to the present as well. In general, the majority of the farmers in Anuradahapura and Ampara opted government purchasing channel while the majority in Polonnaruwa and Baticaloa selected private marketing channels. Presence of large scale private sector mills in Polonnaruwa attracted the majority proportion of the farmers towards them. Previous studies found that, nearly 160 functioning mills were located in Polonnaruwa and interestingly, nearly 75% of mills concentrated in the Tamankaduwa and Hingurakgoda divisional secretariat areas. However, it is also highlighted that major paddy producing areas such as Elahera, Dimbulagala, Manampitiya, Medirigiriya and Welikanda have only a few mills. The most of the large scale rice mills are also located in Polonnaruwa district and during the harvesting period they purchased paddy competitively (Wijesooriya and Priyadarshana, 2013). However, in Ampara and Anuradhapura districts the spread of private rice mills is quite low and as a result of that the majority of the farmers sell their paddy to the government purchasing centers. In Batticaloa, large scale lowland farmers mostly preferred the private sector paddy purchasing schemes. Furthermore, the majority of the farmers in Batticaloa study areas sell their wet paddy soon after harvesting to a large rice mill located in Vavunativu area. However, it is noted that the number of farmers who get involved in paddy cultivation in Batticaloa in *Yala* season is rather low due to the inadequate water supply.

4.6 Farming Experience

Experience of household in farming is another critical factor which affects the choice of marketing channel. If farmers, had prior experience related to alternative channels it automatically help them to select the best channel for the farmer according to the context. In this case, majority who selected the private paddy marketing channels, except in Ampara (16% in Anuradhapura, 17% in Batticaloa and 28% in Polonnaruwa) had 30 to 40 years of experience in farming (Table 4.8). The second highest (12%) number of the private channel selection was done by the farmers who had 20 to 30 years of experience in farming. However, in general it is proven that higher the experience in farming higher the tendency of the farmers to prefer the government paddy marketing channel. The farmers who selected the government paddy marketing channels, mainly (16%) had 20 to 30 years of such experience. No significant variation of paddy farming experience was recorded in marketing channel of the

public and private farmers. More than 80% of the farmers have more than 20 years of experience in engaging farming activities.

Table 4.8: Distribution of Experience of HH

Type of Farmer	Experience Level	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	<10yrs	3	1	6	-	2
	10=<exp<20yrs	5	5	6	16	8
	20=<exp<30yrs	9	11	8	22	12
	30=<exp<40	16	10	17	28	16
	40=<exp<50yrs	5	8	11	5	7
	=>50yrs	2	4	8	-	3
Gvt.	<10yrs	4	2	-	1	2
	10=<exp<20yrs	13	4	6	3	6
	20=<exp<30yrs	16	17	8	16	16
	30=<exp<40	14	16	14	8	13
	40=<exp<50yrs	12	13	8	-	9
	=>50yrs	1	9	8	-	5
Total	<10yrs	7	4	6	1	4
	10=<exp<20yrs	18	9	11	19	14
	20=<exp<30yrs	25	28	17	38	28
	30=<exp<40	29	26	31	36	30
	40=<exp<50yrs	17	21	19	5	16
	=>50yrs	3	13	17	-	8

Note: Pvt. – Private; Gvt. – Government
Source: HARTI survey data, 2017

4.7 Housing Condition

Houses of the majority (85%) of the respondents had cement floors, brick walls and tiled roof which were at a satisfactory condition. A negligible number (1%) had wattle and daub huts thatched with cadjan / straw (Table 4.9). In general, most of the farmers (85%), irrespective of their marketing channel possessed type 1 houses. Both in Anuradhapura and in Ampara more than 90% of the farmers owned type 1 houses. On the contrary, in Batticaloa and in Polonnaruwa a considerable number (39% and 26% respectively) of the farmers owned the type 2 houses. Almost all the houses had power supply.

Table 4.9: Distribution of Status of House of HH

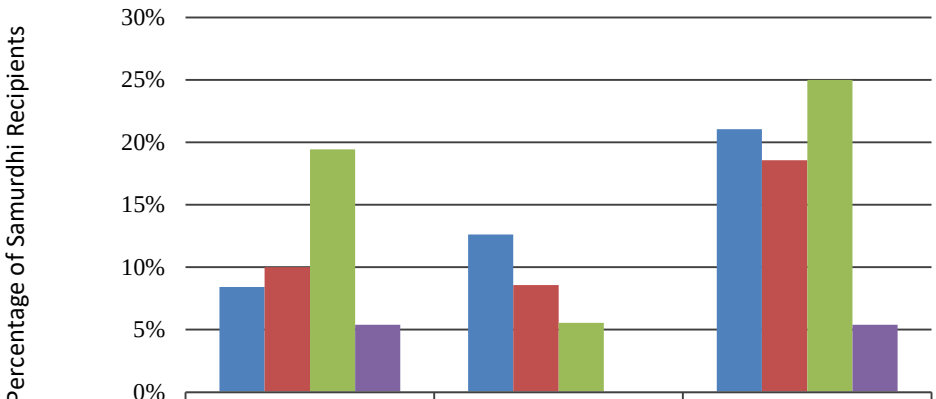
Type of Farmer	Status of the House	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	Type 1	36	36	39	49	39
	Type 2	5	3	14	23	15
	Type 3	-	-	3	-	1
Gvt.	Type 1	57	56	19	24	33
	Type 2	2	5	25	3	12
	Type 3	-	-	-	1	-
Total	Type 1	93	92	58	73	85
	Type 2	7	8	39	26	15
	Type 3	-	-	3	1	1

Note: Pvt. – Private; Gvt. – Government
Type 1 - cement floor or tile and brick walls; Type 2 – Non cement floor and brick walls; Type 3 – clay mud floor and clay walls with coconut leaves / straw
Source: HARTI survey data, 2017

4.8 Distribution of *Samurdhi* Beneficiaries among the Farmer Population

The study found that 59 farmer households are the recipients of "*Samurdhi*" in the whole sample and it is 17 percent. The following table describes the marketing channel choice of those farmers. Out of all the four districts the highest and the lowest number of *Samurdhi* [4] recipients were observed in Batticaloa and Polonnaruwa respectively (Figure 4.2). Moreover, majority of the *Samurdhi* recipients in the total sample selected private purchasing schemes. None of the *Samurdhi* recipients in Polonnaruwa has selected the government paddy purchasing schemes. This implies that, majority of the respondents who received subsistence, tend to select the private schemes surpassing those of the government. Indirectly, this demonstrates the active presence and action of the private sector in the process of paddy purchasing in these areas and also the credit bond of the farmers to the private sector buyers. Furthermore, the study found that farmers who sell more quantity of their harvest as wet paddy (high moisture paddy soon after harvest) are more likely to select private purchasing channels. These farmers tend to sell wet paddy due to lack of proper storage and credit bond to the informal sources.

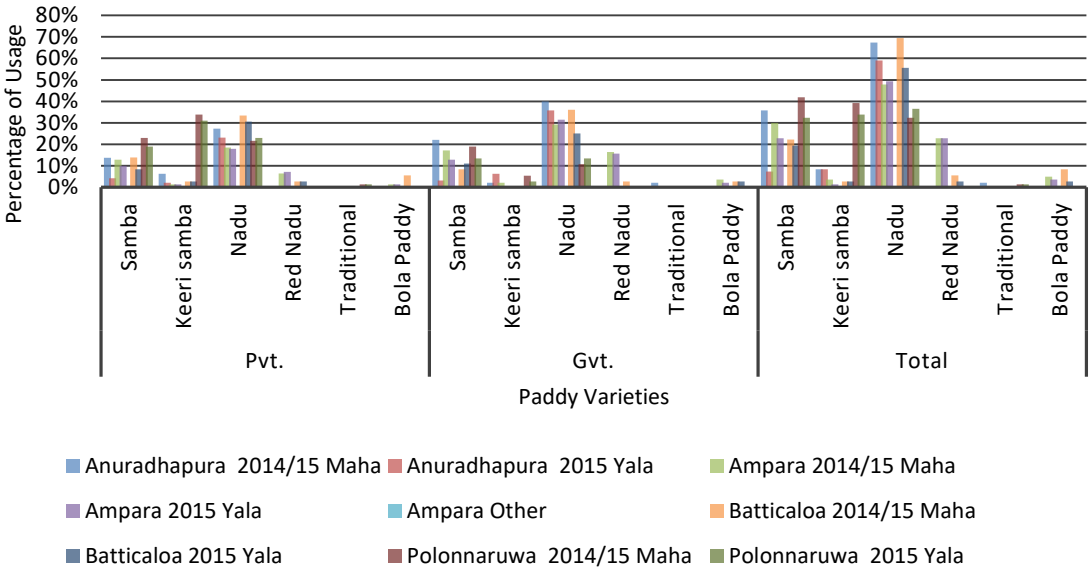
[4] People who are protected by the social safety nets



	Pvt.	Gvt.	Total
Anuradhapura	8%	13%	21%
Ampara	10%	9%	19%
Batticaloa	19%	6%	25%
Polonnaruwa	5%	-	5%

Note: Pvt. – Private; Gvt. – Government
Source: HARTI survey data, 2017

Figure 4.2: Marketing Channel Choice of *Samurdhi* Recipient Paddy Farmers



Note: Pvt. – Private; Gvt. – Government
Source: HARTI survey data, 2017

Figure 4.3: Variety Distribution of Paddy

4.9 Variety Distribution of Paddy

In general, *Nadu*[5] has been the prominent paddy variety in all four districts in all the seasons (Figure 4.3). The second preference has been given to *Samba*[6] variety. In Ampara *red nadu* paddy variety was the third preference of the farmers, whereas in Anuradhapura and Polonnaruwa it was *keeri samba*. However, in Polonnaruwa distribution of all three paddy varieties namely; *Nadu*, *Samba* and *Keeri samba* were relatively equal in terms of usage. More importantly it is observed that, most of the paddy varieties are equally distributed among both the government and the private channels.

4.10 Analysis of the Factors Influencing Marketing Channel Choice by the Paddy Farmers in Major Producing Districts.

The choice of the marketing channel is a fundamental and important decision for the farmers where many factors and conditions have to be considered as a basic for a precise decision. The *logit* model on the farmers marketing channel selection was empirically tested using data collected from paddy farmers in major producing districts in the country. The model-1 and model-2 have been explained in chapter 3 (methodology) under model specification. According to the Table 4.10 & Table 4.11, Model-2 was preferred over model-1, as it gave log likelihood ratio closer to zero and higher pseudo r^2 value compared to model 1.

[5] Long Grain Paddy Variety
[6] Short Grain Paddy Variety

Table 4.10: Descriptive Statistics of Both Farmers who Sold Paddy to Government and Private Channels

Characteristics (Variables)	Overall n=345	Pvt. n=167	Gvt. n=178
	Mean	Mean	Mean
Age (years)	54.99	55.05	54.93
High land extent (ac.)	1.56	1.63	1.49
Low land extent (ac.)	3.35	3.53	3.18
Experience in paddy farming (yrs)	28.65	28.35	28.93
Family labour availability (nu)	2.97	3.10	2.84
Distance to Paddy Marketing Board Center (km.)	5.72	4.99	6.42
Distance to private mill (km.)	5.81	4.93	6.64
Distance to private collector (km.)	1.53	1.17	1.86
Quantity of wet paddy sold (kg.)	349.89	480.53	227.32
Sold marketable surplus of paddy (*Maha*) (kg.)	1857.06	2172.59	1561.02
Income from other field crops (*Yala*)/Rs. per month	4803.34	4684.78	4914.57
Income from other field crops (*Maha*)/Rs. per month	4534.62	5458.75	3667.61
	Percentages		
Secondary occupation (yes)	82.02	80.80	83.10
Availability of paddy storage space (yes)	90.72	94.60	87.10
Samurdhi recipient status (yes)	17.10	19.10	15.00
Status of getting a loan from an informal source for agricultural purpose (yes)	10.72	12.00	9.60
Pawning of jewellery for agricultural purpose (yes)	55.36	54.5	56.2
Having an own transport facility to transport paddy (yes)	37.97	32.30	43.30

Source: Authors' survey data, 2017

Table 4.11: The Model Statistics

Variable	Model-1	Model-2
Age (years)	-.0109126	
	(.0133101)	
Level of education (levels)	.1257198	
	(.3430482)	
Secondary occupation (yes/no)	-.0973686	
	(.2973656)	
Highland extent (ac.)	-.0066055	
	(.0564823)	
Lowland extent (ac.)		-.0354221*
		(.0365762)
Experience in paddy farming (yrs)	.0107309	
	(.0124155)	
Family labour availability (nu)	-.1299646	
	(.08392)	
Samurdhi recipient status (yes/no)	-.2519681	
	(.3098389)	
Availability of paddy storage facility (yes/no)	.85166**	.8380584*
	(.4181302)	(.4285238)
Distance to Paddy Marketing Board Center (km.)	.0478563**	.0363864*
	(.0212427)	(.0219522)
Distance to private mill (km.)		.0322973
		(.0212158)
Distance to private Collector (km.)		.3894877**
		(.1140567)
Status of getting a loan from an informal source for agricultural purpose(yes/no)		.3227108
		(.298301)
Pawning of jewellery for agricultural purpose (yes/no)	-.0560976	
	(.2262485)	
Having an own transport facility to transport paddy (yes/no)	-.4138024*	
	(.2351727)	
Quantity of wet paddy sold (kg.)		-.0001699*
		(.0000977)
Sold marketable surplus of paddy (*Maha*) (kg.)	-.000048	
	(.0000416)	
Income from other field crops (*Yala*)/Rs. per month		-3.20e-06
		(6.17e-06)
Income from other field crops *(Maha*)/Rs. per month		-5.71e-06
		(6.89e-06)
Constant	.9937443	-2.222022**
	(1.175804)	(.7929733)
Number of observation	**345**	**345**
Likelihood ratio chi^2	**22.95**	**37.69**
Probability of chi^2	**0.0423****	**0.0000****
Pseudo R^2	**0.0480**	**0.0789**
Log likelihood	**-227.48526**	**-220.11491**

** and * indicate the significant levels of 5% and 10% respectively.
Figures in parenthesis indicate the standard errors of estimates

4.11 Factors Influencing Marketing Channel Choice

As it is indicated in model -2, the estimated coefficient of variable 'Distance to private mill' has reported more than 5% of significance level. Estimated coefficients of variable 'Distance to Paddy Marketing Board enter' has reported positive value, thus affected positively and significantly (5%) for selection of GPPP. On the other hand, assessed coefficient of the variables such as; 'Quantity of wet paddy sold' and 'Low land extent' have reported a negative value, hence affected negatively and significantly for selection of GPPP.

Positive significant coefficient of 'Distance to Paddy Marketing Board Center' reflects that, even if a selected farmer is residing far from the PMB center, he or she is more inclined to select GPPP. This is mainly because in peak harvesting months like February to March the price gap between the open farm gate price and price offered by the PMB centers is comparatively different. PMB centers offer more price premium than in the open market and in some cases this was more than Rs.10.00/kg. Therefore, regardless of distance farmers tend to select the PMB stores.

The context in which farmers sell paddy to the PMB centers explains this further. The normal procedure is that the farmers take their supply to the nearest PMB centers as the first step. The distance to the nearest PMB center is generally in 10-15km from a farmer's residing place. The farmers who had late harvesting as well as those faced with problems and experienced delays in the process were unable to sell their harvest to the PBM store as it was filled by the time they reached there. Therefore, each farmer had to transport their harvest to relatively larger PMB centers with higher capacity, which are situated far from their residing place, often one only in 2 DSDs. In such cases, some farmers had transported their harvest 20-30km to the PMB center, which indicate their preference to the GPPP regardless the distance they have to travel. It is envisaged that, irrespective to distance farmers who opted government paddy purchasing channel more likely to select PMB centers. Interestingly, it is noted that, those farmers also selected private mills than to the village level collectors' shops. In general, during peak harvesting seasons, village level collectors offer the lowest paddy prices, whereas private mills located in distantly offer somewhat higher prices. However, PMB centers offer the guaranteed price which is higher than both collector price and miller price.

Generally, farmers maintain a considerable space to store paddy used for home consumption. However, this is not a proper storage facility to store surplus paddy for a longer period. The farmers who do early harvesting often have to store their paddy for about a period of one month, in safe condition, until the PMB empty their stores and commence paddy purchasing. Therefore, the paddy growers who do not have safe storage facilities are somewhat reluctant to keep the harvest for 3-4 weeks for sale to the PMB. They often prefer selling wet paddy to the private buyers, who comes to their fields during the time of harvesting.

In present study, “Quantity of wet paddy sold” is the variable which indicates negative and significant impact on selecting GPPP. It points out that if “Quantity of wet paddy sold” increased by one unit, on average the estimated log likelihood value decreases by 0.0002, signifying a negative relationship between selection of GPPP and the considered variable. It means if a particular farmer tended to sell higher quantity of paddy as ‘wet paddy’ he or she is less likely to select GPPP. As a result of wet paddy arriving to the market the prices decline sharply and the farmers who produce dried paddy also received low prices due to the market distortions. From recent years combined harvesters are the most popular harvesting method in almost all major producing areas. Farmers tend to use the combined harvesters mainly due to the low cost compared to the other methods. However, the combined harvester’s threshed paddy has high moisture content (nearly 20%) need to dry out to maintain the standard moisture level.

As explained in the above, farmers who does not have safe storage facilities, who has difficulties in finding a suitable place and the required labour to dry the paddy up to 14% moisture level and the farmers who have immediate cash needs are more inclined towards selling paddy without drying at the paddy fields, to private buyers. On the other hand, farmers who sell less quantity of their harvest as wet paddy are more likely to select GPPP over private purchasing channel, due to price premium that they can enjoy by selling to PMB centers.

In addition to that, the average lowland land extent of farmers negatively significant. This means when the average land extent is lesser, then the farmers tend to opt the PMB centers. In general, PMB centers purchase only 2,500 kg of paddy from a farmer. This also results small scale low land farmers to sell their paddy for the government channels. This means there are more opportunities in government paddy purchasing channel for small scale farmers who produce limited surplus of paddy. Similar results also reported in the studies of Prasanna *et. al.,* (2011) and Sabur *et. al*., (2003).

Study also found that, from the total farmers 40% have obtained any type of loans for agricultural purposes. Further, 55% of farmers have pawn their jewelry to obtain money for agricultural purposes. This indicates the indebtedness level and credit binding nature of paddy farmers. Literature also suggests that, there is a limited choice for such farmers.

The model estimation results have provided useful insights into the farmer characteristics of marketing channel choice of paddy farmers in Sri Lanka. It further reveals the farmers’ preference of GPPP regardless of the distance to the PMB center, mainly due to the price premium they received. However, delay in the commencement of procurement by the PMB has restricted the access of resource poor farmers to the GPPP. As the farmers revealed, majority of the centers in Batticaloa and Ampara districts had commenced their procurement programmes in late March though the peak harvesting period falls in February. Similarly, most of the

paddy procurement in Anuradhapura and Polonnaruwa had commenced in April even though the peak harvesting was done in March.

In the circumstances, the farmers who face difficulties in storing paddy in a safe place (normally wild elephants were attracted to the smell of paddy and thereby storing of paddy became dangerous in the areas where elephant attack were frequent) are hesitant to store paddy in their houses, though they have enough space to store paddy. Hence, these farmers tend to sell wet paddy, mostly to the village level collectors and local millers who purchase paddy in the paddy lands at the time of harvesting. Thus, timely intervention in procurement process is very important to increase the access to GPPP for resource poor, vulnerable farmers.

Table 4.12: Selling Paddy to Private Sector

Type of Buyer	Anuradhapura (%)	Ampara (%)	Batticaloe (%)	Polonnaruwa (%)	Total (%)
Village Level Collector	23	7	0	13	14
Local Miller	44	24	65	46	40
Outside Miller	29	61	35	38	43
Other	4	8	0	3	5

Source: HARTI survey data, 2017

4.12 Marketing of Paddy to Private Sector

The table 4.12 indicates the type of buyers in the private sector to whom the farmers sold their paddy. It reveals that in all districts except in Ampara 50% of the farmers sold paddy to either the village level collector or the local miller. It is observed that normally village level collecting shops in Ampara and the Batticaloe areas in the Eastern Province are less comparable with those at Anuradhapura and Polonaruwa. Another factor is that rice mills are quite inadequate to deal with the huge surplus especially from the Ampara district. Previous studies also found that there are areas in Ampara and Batticaloe districts where during the peak harvesting season the prices regularly drop. However, in Kalmunei, Akkeripatthu and Samanturei areas there is a milling zone with small and medium scale mills. This study covered Damana, Lahugala and Uhana in Ampara and Manmunai West and Eravur in Batticaloe district. In all areas the study observed a scarcity of village level collectors. Therefore, the main buyers in Ampara are the outside millers from Kalmunei, Akkareipatthu and Samanturei or large scale millers from Polonnaruwa. The study observed that nearly one fourth of the farmers in Anuradhapura sold paddy to the village level collectors. The study brings into sharper focus the need for intervention in some form to organize and strengthen the village level collectors and local mills in Ampara and Batticaloa enabling the paddy farmers to reap more benefits.

4.13 Income of the Paddy Farming Households

Paddy farming is still the main occupation in rural areas of Sri Lanka, especially in Eastern and North Central Provinces. The household of paddy farmers consists of an individual and all family members, or a group of individuals, who live together and have responsibility to the household head. They are engaged in farming as their main job as well as other jobs to support household income. The members of paddy farmer household are involved in some economic activities, both in rural and urban areas. Given this importance study examine the income of paddy farmers in survey districts. The monthly gross total income by farmer's who sold paddy to the government stores and private sector was calculated. Seventy-five, 85, 94 and 91 percent of the sample farmers reported that farming is the main occupation in Anuradhapura, Ampara, Batticaloa and Polonnaruwa respectively. The monthly gross income was categorized by districts and by farmer type. A review of the agricultural and the total income of paddy farming households and their links to both the private and the public marketing channels in major producing areas is an important input to making paddy/rice sector policies.

Table 4.13: Monthly Gross Agricultural Income Distribution of Households

Type of Farmer	Total agricultural Income category (Rs)	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	<25000	41	71	75	38	54
	25001-50000	28	11	10	51	28
	50001-75000	21	7	5	11	11
	>75000	10	11	10	0	7
Gvt.	<25000	45	58	31	43	49
	25001-50000	30	26	31	33	29
	50001-75000	11	7	31	19	12
	>75000	14	9	6	5	10
Total	<25000	43	63	56	39	52
	25001-50000	29	20	19	46	28
	50001-75000	15	7	17	14	12
	>75000	13	10	8	1	9

Source: HARTI survey data, 2017

The percentage of the farmers who exceed the gross agricultural income of Rs 50,000 per month is 28, 17, 25 and 15 in Anuradhapura, Ampara, Batticaloe and Polonnaruwa respectively. Monthly agricultural income and the total income of the farming households who had selected the government paddy purchasing channels, is slightly higher than the farmers who opted private marketing channel. This information is revealed by the table 4.13 & 4.14. The table 4.13 also reveals that the nearly half of

the farming household's agricultural income less than Rs. 25,000 per month. It is noted that the number of farmers who get involved in paddy cultivation in Batticaloa in *Yala* season is rather low due to the inadequate water supply.

Table 4.14: Monthly Total Gross Income Distribution of Households

Type of Farmer	Total Income Category (Rs)	Anuradhapura (%) n = 95	Ampara (%) n = 140	Batticaloa (%) n = 36	Polonnaruwa (%) n = 74	Total (%) n = 345
Pvt.	<25000	13	49	45	11	28
	25001-50000	31	18	20	36	27
	50001-75000	28	18	15	28	23
	>75000	28	15	20	25	22
Gvt.	<25000	20	29	25	14	24
	25001-50000	21	32	31	24	28
	50001-75000	25	15	25	38	22
	>75000	34	24	19	24	26
Total	<25000	17	37	36	12	26
	25001-50000	25	26	25	32	27
	50001-75000	26	16	19	31	23
	>75000	32	20	19	24	24

Source: HARTI survey data, 2017

The gross total income of the HH consists of both agricultural and non-agricultural income. It is clearly evident that, in all four districts the average monthly gross agricultural income is higher than the average monthly gross non-agricultural income (Table 4.15 & Figure 4.4). When agricultural income proportions are compared, in districts except in Anuradhapura and Ampara farmers, who opted for the government purchasing channels earned more income than the private paddy channel selectors. However, in general average monthly gross agricultural income of the farmers in Anuradhapura was comparatively higher than that of the farmers in the other three districts. This was mainly due to their cropping pattern which included the cultivation of cash crops like soya bean, black gram, big onion and vegetables (pumpkin, cabbage, beet root and green chilies) in the *Yala* season. They received a considerable income from these crops other than from paddy. The farmers in Ampara received an agricultural income other than paddy from Sugarcane, maize and cowpea cultivations. In Batticaloa, farmers received an income mainly from groundnuts cultivation in addition to the income from paddy. Polonnaruwa farmers mainly cultivated paddy in both seasons and occasionally they cultivated manioc and their highlands for other agricultural income.

The non-agricultural income mainly consists of earnings from the private sector jobs, the government jobs like village security forces, labouring and self-employments. It

must be noted that the income from livestock is also included in non-agricultural income category.

Table 4.15. The Average Monthly Income of Paddy Farming Households by District

Type of Income	Anuradhapura	Ampara	Batticaloa	Polonnaruwa
Non-Agriculture Income (Rs)	24,606	16,857	10,870	24,136
Agriculture Income (Rs)	41,847	33,349	36,891	33,961
Total Income (Rs)	66,452	50,206	47,761	58,097

Source: HARTI survey data, 2017

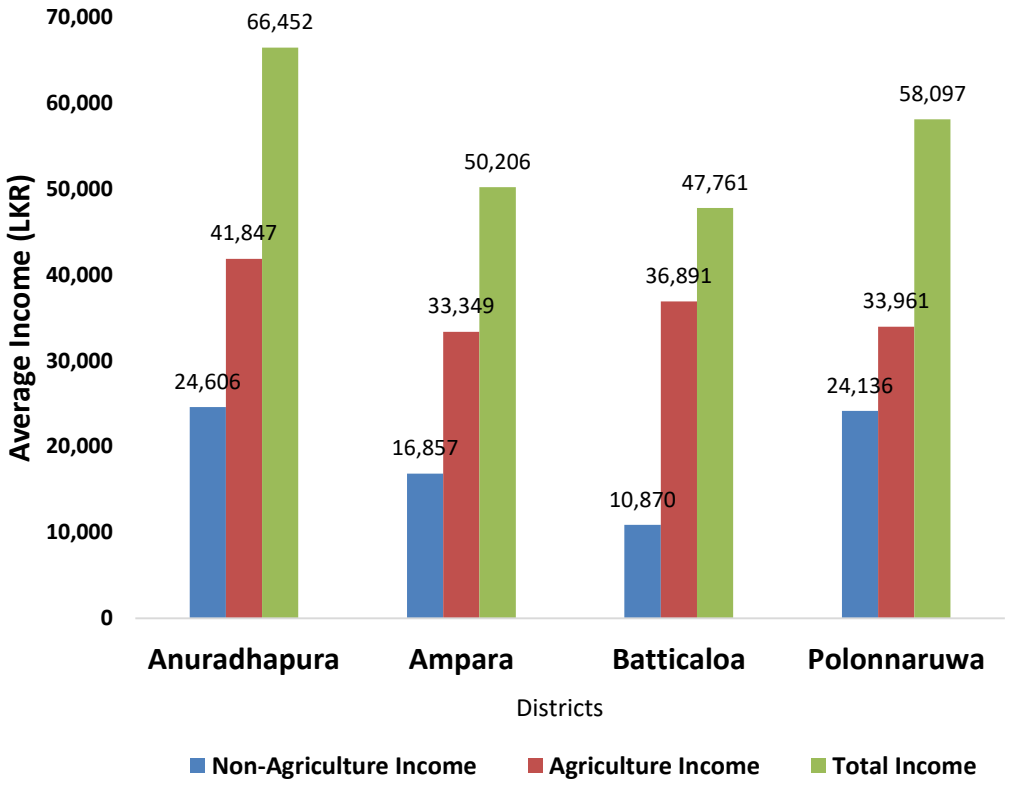


Figure 4.4: The Average Monthly Income Distribution of Households by District

4.14 Cost of Production of Paddy

The study examines the cost of production of paddy in the study areas. It was clear that the GP, s is not change after the 2014/15 *Maha* season. Now four years have gone and the main determinant of GP, s the cost of production of paddy was changed. The following table reveals that the changes of the total cost, unit costs and as the main inputs machinery and labour costs in major producing districts.

Table 4.16: Comparison of Cost of Production of Paddy

Item			2014/15	2017/18	Change
			Rs/Acre		%
Total Cost (Whole Island Irrigated)			41719.00	55722.10	33.57
			Rs/Kg		
Unit Cost (Whole Island Irrigated)			20.52	25.76	25.54
Ampara			18.53	24.12	30.17
Anuradhapura			20.31	26.05	28.26
Polonnaruwa			18.38	24.50	33.30
Cost by Activities					
Machinery Cost	Ploughing Cost (4W Tractor)		Rs/Ac		%
		Ampara	6875.00	7907.00	15.01
		Anuradhapura	7407.00	8116.00	9.57
		Polonnaruwa	8000.00	8704.00	8.80
	Harvesting Cost (Combined Harvester)	Ampara	6800.00	7518.00	10.56
		Anuradhapura	9756.00	8899.00	-8.78
		Polonnaruwa	7977.00	8262.00	3.57
Labour Cost			Rs/Man day		%
		Ampara	1006.00	1193.00	18.59
		Anuradhapura	1008.00	1261.00	25.10
		Polonnaruwa	1041.00	1284.00	23.34

Source: Cost of Cultivation of Agricultural Crops/ Department of Agriculture, 2014/15 & 2017/18

Assurance of a remunerative and stable price environment for paddy farmers is very important for increasing rice production and productivity. To encourage production, the government announces a guaranteed price (GP) for paddy time to time. GP is viewed as a form of market intervention by the central government and as one of the supportive measures (safety nets) to the paddy producers. These prices are mainly enforced by purchases at GP by the Paddy Marketing Board (PMB).

The above table 4.16 reveals that the main determinant of GP of paddy, the cost of production has increased by nearly 30% in 2017/18 *Maha* season, when compared to the 2014/15 *Maha* season, which was the last GP, s fixed season. The increase was mainly due to the increase of labour and machinery costs over the time in major producing areas like Ampara, Anuradhapura and Polonnaruwa.

Table 4.17: The Household Income Derived from Paddy Farming

Description	Units	Value
The average paddy cultivated extent	Acers	3
Average yield	Bu/Ac	95
Total yield for three acres(A)	Kgs	5842
For seeds	Kgs	165
For consumption	Kgs	512
Subtotal(B)	Kgs	677
Marketable surplus(A-B)	Kgs	5165
Guaranteed price(GP) of paddy	Rs/Kg	38.00
Gross income per season	Rs	196270.00
Gross income per month	Rs	32711.67
The average household expenditure (HIES, 2016)	Rs/Month	45000.00
Income deficit	Rs/Month	12288.33
To overcome deficit from paddy cultivation, GP need to increase up to	Rs/Kg	**50.00**

Source: HARTI survey data, 2017

4.15 Household Income Status of Paddy Farmers

Based on the research done, the paddy farmers in all producing areas rely heavily on agricultural income as main source of income. The study also found that paddy cultivation is the major contributor to the total agricultural income of the farmers mainly in Ampara, Batticaloe and Polonnaruwa districts.

According to the present research study the average cultivated extent of paddy is nearly three acres in a particular season by a farmer in Anuradhapura, Polonnaruwa and Ampara districts. The yield ranges 80-130 Bu/Ac and the average is 95 Bu/Ac (Table 4.17). The farm household keep for domestic consumption is nearly 25Bu (512Kgs) for a season. Normally a farmer keeps 2 to 3 Bushels/Ac to fulfil the seed paddy requirement of next season. This requirement nearly 165 Kgs per three acres.

And according to that, as shown in the above table 4.17 the amount of surplus release to the market by a farmer is nearly 5165 Kgs. And the gross monthly income of the farmer has been calculated according to the present guaranteed price. And it is nearly Rs 32712/= per three acres. According to the nearest Household Income and Expenditure survey of the Department of Census and Statistics, 2016, the monthly expenditure of a household of the above districts approximately Rs 45,000.00. Therefore, a family of which the main income is based on paddy cultivation needs an additional amount of Rs 12,288/= to balance the expenditure.

However, this income gap does not affect the farmers who has some other types of agricultural and non-agricultural income than paddy and their income lies at a higher level. Therefore, it is necessary to involve farmers in programmes which enhance their

income in long term basis. These programmes include, the farmers in districts like Polonnaruwa where the cropping pattern is paddy cultivation in both seasons should be introduced other cash crops mainly in *Yala* season. The farmers must be encouraged to cultivate cash crops in their highlands. In addition to the above the other members of the farmer families should be introduced non-agricultural opportunities that are suitable for their areas.

The present study also reveals that except Anuradhapura, the main cropping pattern of farmers in Ampara, Polonnaruwa and Batticaloe is paddy cultivation in both *Maha* and *Yala* seasons. But in Anuradhapura cash crops like vegetables, chilies, soya bean, black gram, big onion and maize are cultivated in highlands and paddy lands in *Yala* season from which a considerable income is received. Therefore, the farmer's income of the other districts should be increased by introducing some suitable cash crops through which the farmers can get another income mainly in *Yala* season.

The non-agricultural income mainly consists of employment in armed forces, civil security forces, skilled employments, labouring and foreign employments. The present study has considered animal husbandry as a non-agricultural activity. The study found that in Polonnaruwa dairy farming at domestic level was a popular source other than the paddy farming. The farmers in Damana area in Ampara are involved in sugarcane cultivation with Hinurana sugar company under the as an out grower programme. All inputs like planting materials, fertilizer, land preparation machineries are provided to the farmers by the company and the harvest is purchased by pre agreed price.

Considering all the above mentioned information the GP of paddy must be Rs.50.00/Kg or more for fulfill the income gap of paddy farmers. Therefore, as a short term measure it is necessary to increase the GP of paddy up to the above level.

As long term to increase paddy farmers' incomes, income from other agricultural activities and off-farm income should be expanded and enhanced. Off farm employment is an alternative strategy and has the potential to improve the income and well-being of paddy farmers. It also helps to reduce income uncertainty in rural areas. The income of paddy farmers whose main income source is the cropping pattern of paddy cultivation in both seasons should be increased. The majority of the farmers in Ampara, Polonnaruwa and Batticaloa is included in this category.

CHAPTER FIVE

Farmers Perception on Different Types of Paddy Marketing Methods

This chapter deals with the farmer's perception on different types of paddy purchasing methods, related issues and problems they faced. The chapter also provides the newly introduced process of warehouse receipt marketing system related to the grain marketing. A number of paddy purchasing approaches and their impact were included, through statements and questions. Farmers were asked about their level of satisfaction or perception of these approaches. The study depended on the Likert Scale. It dealt with the variables; strongly agree, agree, neutral, disagree, and strongly disagree. The weights were given as follows: strongly agree (5), agree (4), neutral (Neither Agree nor Disagree**)** (3), disagree (2), and strongly disagree (1). The mean of each method was calculated based on the weights that were designated in advance (5 weights) in order to identify the trend for each methods or issues. The level of satisfaction of farmers with different approaches related to the paddy marketing is described in detail by district is as below.

5.1 Present Private and Public Purchasing Method

The present paddy purchasing system in the country comprises both the public and the private sector participation. The paddy production in the war affected areas such as Batticaloa, Trincomalee, Ampara and Mannar increased significantly after 2009 as the war ended. The market equation of paddy started to change as a result of a huge surplus reaching the market from those areas. Therefore, the role of the Paddy Marketing Board (PMB) as a public sector institution has become prominent in stabilizing the paddy market than ever before. The PMB continued purchasing paddy increasing the amount gradually every season and reached the highest ever in the year 2015. In 2015, the PMB purchased 335,582 Mt of paddy and it was 8% of the total paddy production and nearly 11.5 % of the total marketable surplus. Remaining 90% of the marketable surplus of whole paddy production was purchased by the private sector every year. Large, medium and small scale millers of the private sector mainly purchased the paddy in major producing areas to convert to rice. Especially the millers' large scale, medium and small scale purchased paddy up to some extent and stored through pledge loans given mainly by the state banks and the private banks.

When the purchasing data for the last ten years is considered, the annual purchasing of the PMB ranged 1% - 8% of the total paddy production in the country. The government policy intervention in paddy marketing in Sri Lanka mainly focuses on procurement of paddy, fixing and maintaining guaranteed price (GP) of paddy, stock management, grain distribution and disposal of paddy in order to stabilize the rice market. The government intervenes in paddy marketing mainly through the government parastatal, the Paddy Marketing Board (PMB). The major objectives of the PMB procurement programme are to stabilize the farm gate prices, maintaining

guaranteed price (GP) of paddy, buffer stock management and grain distribution and disposal of paddy in order to stabilize the rice market.

Wijesooriya, et al, (2017), examined the impact of the purchasing programme of the PMB by using secondary data of prices, quantities and production data in major paddy producing areas during the period of 2009-2014. The study found that during the peak harvesting months the farm gate price of more than 50 percent of paddy in the Divisional Secretariat (DS) divisions was below the guaranteed price in many of the districts, especially in Ampara and Batticaloa. Farm gate prices of all DS divisions in Ampara district were well below the guaranteed price in 2010 and 2013. The situation was more or less the same in all major producing districts. DS divisions which recorded low prices regularly could be identified in all major producing districts. The observed characteristics of the regular low prices areas were high surplus, low storage facilities, low infrastructure, and lack of modern private rice mills. The study also found that an increasing trend of prices emerged due to the PMB procurement programme and it became an incentive for the farmers. The purchasing programme has contributed to motivate the farmers to produce quality paddy through ensuring the quality in purchasing.

Table 5.1: Farmers Perception on Present Public and Private Paddy Purchasing System

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3)%	Agree (4) %	Fully agree (5) %	Mean score
Anuradhapura (N=95)	17	53	3	25	2	2.43
Ampara(N=140)	14	34	3	43	6	2.91
Polonnaruwa(N=73)	4	34	3	59	0	3.16
Batticaloe(N=36)	0	28	14	58	0	3.31
All Districts(N=344)	11	39	4	43	3	2.88

Source: HARTI survey data, 2017

The farmers' perception on existing purchasing system is important in order to make policies related to the paddy/rice marketing. The table 5.1 indicates that 50% of the farmers are not satisfied with and disagreed to the existing public and private sector paddy purchasing system. Especially in Anuradhapura and Ampara districts sample farmers represent remote DS divisions like Palagala, Kabithigollewa, Mahawillachiya, Uhana and Lahugala which record huge surplus of paddy. In Anuradhapura 70% of the farmers disagree to the present system followed by the 50% in Ampara showing the lowest mean values of responses.

5.2 Increasing Farm Gate Prices when PMB Start Purchasing

Factors like the arrival of high moisture paddy in bulk quantities at the market within a short period, a limited number of private sector buyers haggling for lower prices, contribute to a decline of the farm gate prices in most of the major producing areas during the peak harvesting season. This is the normal practice that occurs in most of the harvesting seasons. In order to stabilize the prices, the government, intervenes by purchasing paddy through the Paddy Marketing Board (PMB).

Table 5.2: Farmers Perception on Statement of Increasing Farm Gate Prices when PMB Starts Purchasing

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3) %	Agree (4) %	Fully agree (5) %	Mean score
Anuradhapura	7	27	16	44	5	3.13
Ampara	4	14	5	58	19	3.75
Polonnaruwa	4	8	8	71	8	3.71
Batticaloe	8	17	8	47	19	3.53
All Districts	5	17	9	56	13	3.55

Source: HARTI survey data, 2017

The study attempted to obtain the farmers' perception of the impact of purchasing programme. The previous study examined the weekly procurements of the Paddy Marketing Board in major producing districts and the behavior of weekly farm gate prices of paddy and it was found that an increasing trend of farm gate prices continued at the beginning of the purchasing programme by the PMB in major producing areas (Wijesooriya, et al, 2017). Therefore, this study examined the farmer's responses to the statement "Increasing farm gate price when PMB starts purchasing". The table 5.2 presents that nearly 70% of the farmers in all four districts agree to the statement reflecting that there is a positive impact of the government paddy purchasing programme in terms of stabilization of farm gate prices. However, in Anuradhapura 34% of the farmers disagree and 16% remained neutral (neither agree nor disagree).

5.3 Appointing Village Level Agents of PMB

Table 5.3 shows the farmers willingness to sell their paddy to the PMB at village level. The study observed that farmers in remote areas in all four districts need to transport paddy to long distances for sale to the PMB stores. This is a much time consuming and costly process the farmers especially highlighted as a problem they faced in selling their produce to government stores. This will be described in detail in a sub chapter to follow.

Table 5.3: Farmers Perception on Appointing Village Level Agents of PMB

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3) %	Agree (4) %	Fully agree (5) %	Mean
Anuradhapura	0	8	1	69	21	4.03
Ampara	1	7	1	65	25	4.05
Polonnaruwa	1	7	1	66	25	4.05
Batticaloe	0	3	0	47	50	4.44
All Districts	1	7	1	65	26	4.09

Source: HARTI survey data, 2017

5.4 Appointing Farmer Organizations (FO's), As Village Level Agents of PMB

Farmers' responses on the appointing of village level agents for the PMB paddy procurement programme was discussed above. However, they showed reduce willingness for the idea of appointing farmer organizations (FO's) as agents (Table 5.4). Farmers in Anuradhapura, Ampara and Polonnaruwa 13%, 17% and 23% respectively disagree to the appointing FO's as agents. However, the findings imply the need of establishing a village level mechanism to purchase paddy through the PMB for the good of the farmers. The above situation reveals that the farmers need a village level mechanism for paddy purchasing instead of the present PMB purchasing system which includes wasting of time and traveling to long distances to the stores.

Table 5.4: Farmers Perception on Appointing Farmer Organizations (FO's), as Village Level Agents of PMB

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3)%	Agree (4) %	Fully agree (5) %	Mean
Anuradhapura	0	12	01	54	33	4.08
Ampara	1	13	03	57	26	3.96
Polonnaruwa	3	19	01	45	32	3.84
Batticaloe	0	08	0	36	56	4.39
All Districts	1	13	02	52	32	4.01

Source: HARTI survey data, 2017

5.5 Farmers Tend to Produce Quality Paddy due to PMB Intervention

Quality of paddy is a major determinant in producing high quality rice which is deteriorated if the paddy had a high degree of moisture and impurities. Low quality

paddy reaches the markets during the peak harvesting periods and it affects the storability and quality of rice. The Paddy Marketing Board acquires paddy from the farmers with certification on its quality. Many criteria are used to determine the quality of paddy such as 14 % moisture level, free of impurities. Agrarian Services Department also gives a certificate about the farmer and the quality of paddy. Then the PMB purchases the certified amounts of paddy as per the proper standards and is transferred to the warehouse. The selected bank branches are kept informed by the PMB about the amounts purchased. Payments are settled by the selected banks for the stocks purchased from the paddy farmers. However, the private sector buyers are not concerned about the quality standards and exploit the farmers by reducing the prices, rating quality at their own will. This situation leads to distort the paddy/rice market eventually giving way to low farm gate prices during the harvesting season. Therefore, the PMB purchasing programme is able to motivate the farmers to produce quality paddy. In this study farmer's perception was examined in this regard.

The following table 5.5 shows that more than 75% of the farmers in all the districts agree (reflecting high mean score values) to this statement and it reveals that the government paddy purchasing programme through PMB definitely contributes to encourage farmers to produce quality paddy.

Table 5.5: Farmers Perception on Farmers Tend to Produce Quality Paddy due to PMB Intervention

District	Strongly Disagree (1) %	Disagree (2) %	Neither agree nor disagree (3) %	Agree (4) %	Fully agree (5) %	Mean
Anuradhapura	7	11	5	45	32	3.83
Ampara	3	9	4	66	19	3.90
Polonnaruwa	0	8	1	81	10	3.92
Batticaloe	0	6	3	56	36	4.22
All Districts	3	9	3	62	22	3.92

Source: HARTI survey data, 2017

5.6 Introducing Bank Card to Withdraw Money From PMB

Countries like India and China have computerized the whole food grain supply chain from the producer to the consumers in order to enhance the efficiency of the grain purchasing programmes. The manual methods should be replaced by computerizing processes. Data should be captured as and when they are generated instead of developing MIS applications for entry of data after manual processes are followed. Using ICT in all purchasing and storage transactions lead to mitigating the corruption, leakages and diversion of funds and enhance the efficiency. Success lessons can be learnt from paddy procurement programme of Chhattisgarh state in India.

Payments are better made to the farmers for paddy purchased by the PMB to build up trustworthy relationship between the farmers and the PMB. One of the complaints made by the farmers was delayed payments. The study examined the farmers' perception on the introducing of an electronic bank card for their transactions in order to enhance the efficiency of the government paddy purchasing programme The table 5.6 shows that over 75% of the farmers in all districts agree (reflecting high mean score values). However, nearly 25% of the farmers in Anuradhapura, Ampara and Polonnaruwa preferred manual transactions.

Table 5.6: Introducing Bank Card for Withdraw Money from PMB

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3) %	Agree (4) %	Fully agree (5) %	Mean
Anuradhapura	20	7	8	40	24	3.41
Ampara	10	14	6	50	21	3.58
Polonnaruwa	10	14	6	50	21	3.58
Batticaloe	0	0	0	44	56	4.56
All Districts	10	9	5	52	25	3.74

Source: HARTI s survey data, 2017

5.7 Dual Guaranteed Prices According to Moisture Content for PMB Purchasing

In India the guaranteed price differs according to the quality of paddy (Table 2.2). The standards related to the normal paddy and grade "A" paddy are defined by the Commission of Agricultural Costs & Prices of India. According to the standards, Food Corporation of India (FCI) procures paddy from the farmers and the millers. The grading system encourages the farmers to produce quality paddy. And it was noted that the Commission of Agricultural Costs & Prices (CACP) of India announced the Minimum Support Prices (MSP) prior to the beginning of every paddy cultivation season. The MSP was determined by the CACP through a very formal methodology by an expert panel consisting of eminent agricultural economists.

Most of the farmers in major producing areas sell paddy soon after the harvest. Here some of the farmers sell paddy after drying it properly to the PMB while the majority dispose of their paddy at the open market soon after harvesting. However, as a result of wet paddy arriving at the market the prices decline sharply and the farmers with dried paddy are also constrained to fetch low prices due to the market distortions. The moisture level of the newly harvested paddy is nearly 21 percent. As the government purchaser, the PMB requires 14% moisture level, free of straw particles and empty seed content less than 9%. The PMB maintains these standards mainly because they purchase paddy for long term storage necessitating, the farmers to dry

their paddy at least for two days to reduce moisture up to the recommended level. Lack of drying yards and immediate cash needs tempt the farmers to sell high moisture paddy. Even paddy with slightly higher levels than the recommended levels of quality is rejected at the PMB purchasing center. In such an intractable situation the farmer is left with no option but to sell it to the private trader at a lower price or transport the paddy back home. Such a situation can be warded off by introducing dual guaranteed prices according to the quality of paddy and it will definitely support the farmers. Therefore, this study examines the perception of farmers on this type of method.

The following table 5.7 indicates high mean score values of responses that the majority (more than 80%) of the farmers in all districts agree with to method.

Table 5.7: Dual GP according to Moisture Content for PMB Purchasing

District	Strongly disagree (1) %	Disagree (2) %	Neither agree nor disagree (3) %	Agree (4) %	Fully Agree (5) %	Mean
Anuradhapura	4	11	2	54	29	3.94
Ampara	9	12	3	56	20	3.67
Polonnaruwa	1	5	1	70	22	4.05
Batticaloe	0	0	6	64	31	4.25
All Districts	5	9	3	59	24	3.89

Source: HARTI survey data, 2017

5.8 Perception on Ware House Receipt Marketing (WHRM)

Warehouse receipt systems allow agricultural producers to access credit by borrowing against receipts issued for goods stored in independently controlled warehouses. These systems enable the producers to delay the sale of their products until the harvest, ends when prices are generally more favourable. Warehouse receipt systems can be an effective mechanism for the mobilization of credit for the agricultural sector and improve agricultural trade. Sri Lanka has launched a negotiable warehouse receipts system with World Bank assistance to help the farmers gain access to loans from banks and avoid difficulties in the sale of agricultural commodities and the programme is mainly facilitated by the Regional Development Bank (RDB) and guided by the Central Bank of Sri Lanka (CBSL), Ministry of Finance and the District Secretaries of the respective districts. The WHRM method operated in Sri Lanka is described in detail in the *Box 1.* The study examined the perception of the farmers to the newly introduced Ware House Receipt Financing method for grain purchasing. The following Table 5.8 indicates that the majority (more than 80%) of the farmers in all districts agree to this method which is shown with high mean score values of responses. The results imply the farmers' urgency to solve the decisive issues of lack of storage and credit which they face at present.

Table 5.8: Perception on Warehouse Receipt Marketing

District	Strongly Disagree (1) %	Disagree (2) %	Neither Agree nor Disagree (3) %	Agree (4) %	Fully Agree (5) %	Mean
Anuradhapura	4	5	1	44	45	4.21
Ampara	4	8	8	54	27	3.93
Polonnaruwa	0	7	1	59	33	4.18
Batticaloe	0	0	0	47	53	4.53
All Districts	3	6	4	51	36	4.12

Source: HARTI survey data, 2017

Box 1: Sri Lanka: Ware House Receipt Financing (WHRM)

Stabilization of farm gate prices in major producing areas during the harvesting seasons was a very important factor, since a larger share of the paddy farmer's income and living standards depends on the changes of paddy price in the open market. During the harvesting season farm gate prices declined drastically, normally in February and March and during the off-season high prices were recorded. Hence, with this situation both farmers and consumers were affected. In order to prevent adverse price fluctuations, the government intervenes in paddy marketing through various approaches like introducing guaranteed prices, government purchasing through PMB and encouraging private sector through offering pledge loans. Most of the farmers in major producing areas sell paddy soon after harvesting for numerous reasons like immediate cash needs to repay the loans, lacking drying yard facilities and lack of proper own storage facilities. As a result of this situation farmers received low prices during the harvesting season and the markets are distorted with the arrival of low quality paddy.

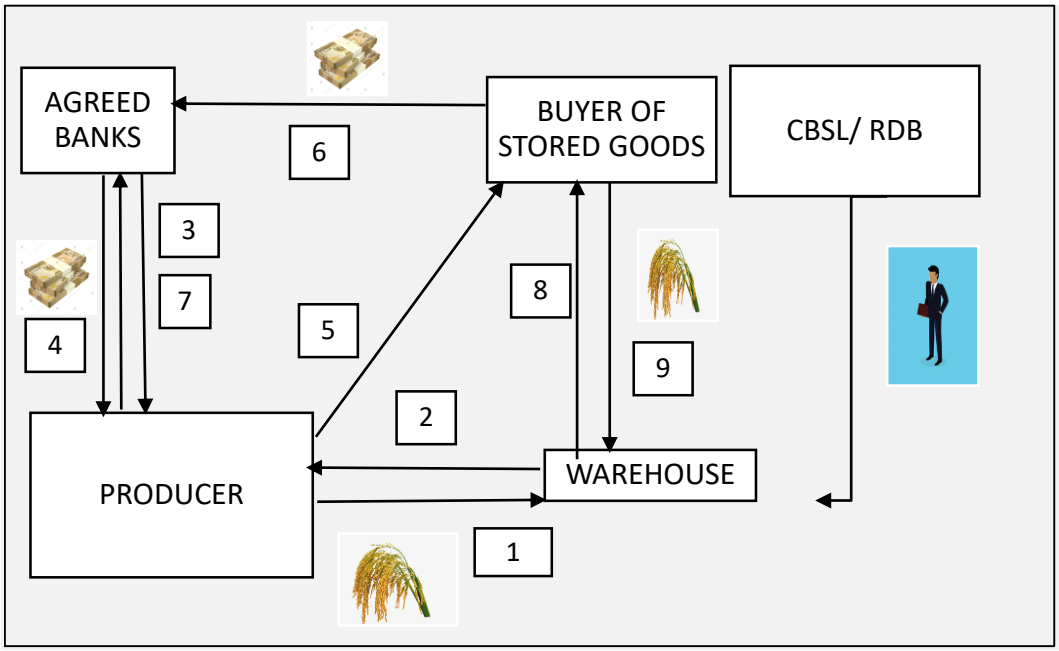
Source: RDB

Figure 5.1: Warehouse Complex in Galenbidunuwewa in Anuradhapura

WHRM is an integral part of an efficient marketing system of agricultural produce, which is necessary not only to prevent the loss arising out of unscientific storage and to equip the farmers with a convenient instrument of credit but also to provide a storage place in the production area at the time of harvesting and to the consumption area during the off season. Sri Lanka has launched a negotiable warehouse receipts system with World Bank assistance to help farmers gain access to loans from banks and avoids difficulties in the sale of agricultural commodities and the programme is mainly facilitated by the Regional Development Bank (RDB). Negotiable warehouse receipts allow transfer of ownership of any agriculture commodity stored in a warehouse without having to deliver the physical commodity.

These receipts are issued in negotiable form, to be used as collateral for bank loans. Warehouse Receipts financing facilitates the dual purpose of providing a value chain service to farmers through warehousing, and access to credit simultaneously against stored produce. The method also leads to enforcement of good agricultural practices to ensure good quality produce. Farmers can obtain credit facilities by offering the stock as security and they can then settle the facility once they sell their harvest at an interest rate of 7% per annum.

Farmers are free to find their own customers or the warehouse administration would contact a prospective high-scale buyer from the buyers registered at the RDB. The temperature-controlled warehouse is raised four ft from the ground and is constructed adhering to the highest international standards. The fully equipped lab is operated by trained officers who test the stock to ensure that it meets the desired quality standards prior.



1. Farmer deposits agricultural goods in warehouse.
2. The warehouse issues the receipt to the farmer.
3. To obtain a loan from a bank.
4. The loan is for a specified % of the market value of the goods in storage.
5. The farmer sells the stored goods underlying the warehouse receipt.
6. Depending on the agreement, the buyer pays producer who in turn pays the creditor.
7. The creditor returns the warehouse receipt to producer.
8. Allows the buyer producer to go to the warehouse, present the receipt.
9. Retrieve the bought goods by the buyer.

CBSL: Central Bank of Sri Lanka

RDB: Regional Development Bank

Source: Authors Survey, 2017

Figure 5.2: Basic Concepts of Warehouse Receipt Financing Practicing in Sri Lanka (Anuradhapura and Mannar)

The study observed the lack of information related to available stocks in the ware houses in a particular website or other media for the use of the buyers both in Anuradhapura and Mannar. Information sharing is of paramount importance to the proper functioning of this WHR system. Warehouses should offer the price, supply and demand information to the market users so as to develop selling and buying strategies. Therefore, the establishment of a robust system for sharing of information, is necessary.

5.9 Perception on Deficiency Payment Method

The present programme of procurement of paddy through the PMB has become a burden to the government treasury. In this method farmer price is supported through deficiency payment. According to this method instead of physically procuring grain, the government compensates farmers through cash subsidy whenever the market price falls below the guaranteed price (GP). The effective price received by the farmers equals the prevailing market price or GP, whichever is higher. Since deficiency payment does not involve procurement of grain it does not cost procurement and storage of paddy. On the whole there is a great saving for the government sector. The method is especially operating in paddy and wheat procurement in India. The benefits of this type of intervention are, minimizing the government costs, accumulating large food grain stocks in its stores over and above the buffer requirement, leading to storage and wastage costs. Under this system, the government can pay in cash to farmers, the difference between the support and market prices. This will actually reduce the need for the government to procure food crops, transport and store them, and then dispose of them under distribution programmes. In terms of this method private sector mills in local areas can purchase the paddy on GP and they can claim the difference of the market price and GP as a deficiency payment from the government. The farmers were made well aware of the methodology and the benefits of this type of methods and their responses were examined. The following table 5.9 indicates that the majority (more than 85%) of the farmers in all districts agree to this method with high mean score values of responses. Therefore, it implies a possibility for implicating this type of market based intervention.

Table 5.9: Perception on Deficiency Payment Method

District	Strongly Disagree (1) %	Disagree (2) %	Neither Agree nor Disagree (3) %	Agree (4) %	Fully Agree (5) %	Mean
Anuradhapura	2	3	9	54	32	4.09
Ampara	0	9	9	64	19	3.92
Polonnaruwa	0	1	0	73	26	4.23
Batticaloe	0	8	3	42	47	4.28
All Districts	1	6	7	60	27	4.07

Source: HARTI survey data, 2017

Table 5.10: Perception on Paddy Pledging Method

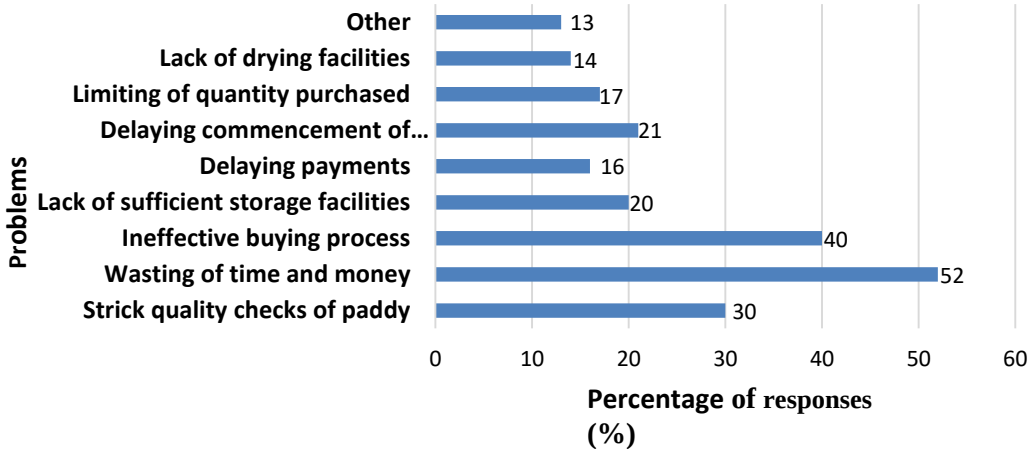
District	Strongly Disagree (1) %	Disagree (2) %	Neither Agree nor Disagree (3) %	Agree (4) %	Fully Agree (5) %	Mean
Anuradhapura	8	18	9	47	17	3.46
Ampara	4	21	14	44	16	3.48
Polonnaruwa	12	12	1	60	14	3.51
Batticaloe	0	22	11	50	17	3.61
All Districts	7	18	10	49	16	3.49

Source: HARTI survey data, 2017

5.10 Perception Regarding the Farm Paddy Pledging Method

The country gets two paddy crops during the year. The major harvest is received from the *Maha* season in March and April and the second harvest from the *Yala* season during July and August. Since the consumption of rice is constant throughout the year, paddy is stored at least for a six months' period until the next season. The involvement of various sectors in storage can be classified as on-farm and off-farm storage systems. The research stated that among the problems faced by the paddy farmers, majority were related to marketing difficulties to obtain a fair income, since the price of paddy decreases to a low level at the harvesting period. However, the price increases within a few months in the off-season (Adikarinayake, 2005). To overcome this situation, the public and the private sector credit institutions implement various types of paddy pledging programmes and some focus on the farm level storage. The objective of this type of credit programmes is providing financial facilities by way of short term loans to small scale paddy farmers to store paddy stocks safely in their home until better price realization in the market and the security of the credit institution is the pledge of the paddy stock. When compared with other interventions mentioned above low responses have been received for this method by representing less than 4 mean scores for all districts (Table 5.10). Nearly one third of the farmers disagree or neither agree nor disagree for the suggested method. They mentioned that the lack of proper storage spaces at domestic level is a greater barrier for this type of intervention.

5.11 Problems Faced by the Farmers Selling Paddy to Government Sector (PMB)



Source: HARTI survey data, 2017

Figure 5.3: Major Problems Faced by the Farmers Selling Paddy to PMB

5.11.1 Wasting of Time and Money:

The highest percentage (52%) of the responses made by the farmers highlighted the waste of time and money when selling paddy to the government stores (figure 5.3). Waiting at the stores for about two days, sometimes more than two days, disappointments caused if the paddy is rejected, waiting in long queues during the peak harvesting time, increased hiring vehicle fare in delaying are the major reasons they pointed out. The situation is worsened by the lack of enough labour hands in stores especially during the peak harvesting season.

5.11.2 Ineffective Buying Process

Another problem stated by the farmers (40% of the responses) was the ineffective buying process. They mentioned preferences given to the traders in the areas in some instances, lack of planning in area wise purchasing, need to pay the workers, delaying of the commencement of purchasing, influential purchasing and lack of basic facilities in store areas as impediments.

5.11.3 Strict Quality Checks of Paddy

The Paddy Marketing Board acquired the paddy from the farmers with certification on its quality. Many criteria were used to determine the quality of the paddy by Agrarian Services Department.

Standards Used in the Purchase of Paddy

1. Dampness (Maximum) - 14%
2. Dirt - 1%

3. Mixture of other varieties - 6%
4. Immature seeds - 9%
5. Should be free of discolored seeds.
6. Free of gravel, sand and dirt.
7. Should be free of damages by insects, insect eggs and other damages.
8. Should be free of fungal infected seeds.

When the criteria were fulfilled the Agrarian Services Department gives the certificate about the quality of paddy suitable for purchasing. The PMB then purchases the certified quantity of paddy as per the proper standards and transfer to the warehouse. The PMB informs the selected bank branches about the quality purchased. The payments are settled by the selected banks for the stocks, purchased from the paddy farmers. This is the basic process of grain purchasing by the PMB. The moisture level of the newly harvested paddy is nearly 21 percent. But the government purchaser, the PMB requires 14% moisture level, paddy should be free of straw particles and with the empty seed content less than 9%. The PMB maintains these standards mainly because they purchase paddy for long term storage. Therefore, the farmers have to dry their paddy at least for two days to reduce moisture up to the recommended level. Nearly three units of hired labour and one unit of family labour have to be utilized for this purpose. However, the farmers claim (30% of the responses) that this procedure is highly strict and less flexible (figure 5.1).

5.11.4 Lack of Sufficient Storage Facilities

The present PMB purchasing center network cannot cater to the huge marketable surplus of paddy created during the peak harvesting season in major producing rural areas in all four districts. In most DS divisions only one storage facility was available and its capacity was mostly less than 3000Mt where as some major DS,s create a surplus to nearly 100000 Mt during the peak harvesting season. The farmers complained that stores were over loaded in a short duration during the harvesting season and they had to travel looking for another store. In the dialogue with the farmers it transpired that Batticaloa which releases a sizeable surplus to the market is in dire need of more storage facilities. During the peak harvesting *Maha* season Batticaloa begins harvesting before other areas. Therefore, especially in terms of the increase of the marketable surplus, the capacity of storage in the producing areas such as Ampara and Batticaloa in the eastern province deserves serious focus. The above figure indicates that 20% of the responses made by the farmers mentioned this reason.

5.11.5 Limiting the Quantity Purchased and Lack of Drying Facilities

The farmers aired their views about the limiting of purchased quantity (17% of the responses) of a farmer and protested that it is a red set back to them. In most of the seasons quantity purchased from a farmer is limited to 2500 Kgs, compelling them to

look for private sector buyers for selling the remaining stocks. Nearly 14% of the farmers commented on a the lack of drying facilities in farming areas as well as in the stores and pointed out that it is a major difficulty due to moisture content of 14% recommended by the PMB. Soon after harvesting the majority of the farmers dry their paddy on one side of the carpeted roads due to lack of proper drying yard facilities. This is a common sight in areas like Polonnaruwa and Ampara during the peak harvesting periods February to April and August to September. However, the farmers stated that this drying pattern causes over and uneven drying of paddy. And also sometimes grain gets damaged by vehicles. They pointed out the need of implementing drying yard facilities in procurement centers as well as in the producing areas which would help to dry paddy just after harvesting.

5.11.6 Delaying the Commencement of Purchasing

Farmers complained that the delay in the commencement of the purchasing programme leads to very low farm gate prices in the open market. They pointed out that the procurement did not take place properly during the peak harvesting month in most of the major producing areas. For example, most of the procurement activities in Ampara and Batticaloa districts had taken place in March, whereas the peak harvesting month is February. In Anuradhapura and Polonaruwa procurements progressed in April when the peak harvesting month was March. This created low farm gate prices during peak harvesting months. In the absence of PMB procurements farmers tend to sell their paddy to the private millers at a low price. This situation implies that intervention is needed as poor farmers become helpless in the absence of a market. The farmers pointed out that timely procurement is imperative for farm gate price stabilization.

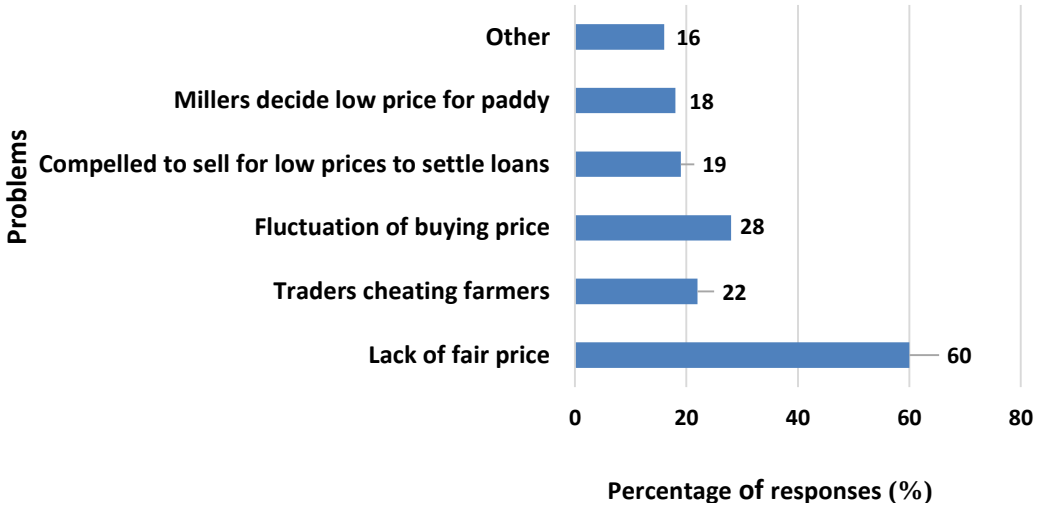
5.11.7 Other Problems

Farmers claimed that they did not receive payments for their bags given to the PMB. priority not given to the small scale farmers, stores in the producing area given on lease to other institutions, lack of proper procurement plan, lack of sufficient labourers in purchasing stores, lack of mobile stores or village level agents were the other issues that emerged in the discussions.

However, the study found that, despite all those problems and distance to the PMB stores, most of the farmers tend to select the PMB stores mainly because the gap between the open farm gate price and the price offered by the PMB centers are comparatively different in peak harvesting months like February to March. PMB centers offer a higher price premium than the open market and in some cases this was more than Rs.10.00/kg. And also it was noted that during the recent past the quantity purchased by the PMB gradually increased during high producing seasons. In most of the seasons PMB was able to maintain the minimum level of buffer stocks of paddy in

order to ensure food security of the country. And also PMB was able to increase the storage capacity to nearly 90 percent during the period of 2008-2014.

5.12 Major Problems Faced by the Farmers Selling Paddy to Private Sector



Source: HARTI survey data, 2017

Figure 5.4: Problems Faced by the Farmers Selling Paddy to Private Sector

The responses given by 60% of the farmers (figure 5.4) center on their inability to receive a fair price. The farmers point out that the private sector attempts to purchase paddy at low prices as much as possible especially in the harvesting season. This situation was stressed by the farmers in Anuradhapura and Ampara districts. The farmers pointed out the need of a government monitoring process when the paddy is purchased at low prices by the private sector. The government has to come out with some mechanism in relevant areas to make the private sector to purchase paddy at least at a price close to the guaranteed price, Hence the farmers insist that the government should monitor the behavioural pattern of the paddy purchasing prices at the Divisional Secretaries division level in major surplus producing districts in the harvesting season.

Another problem they brought to light was the exploitation of the farmers by the unscrupulous traders (22% of the responses). They mentioned that the collectors and millers use fake measuring devices. Another problem presented by the farmers was that the private sector declares constantly change the purchasing price and they always try to purchase at a low price. Especially they change the prices rapidly during the harvesting season. Sometimes the agreed price in the morning is changed at the buying time in the afternoon. Therefore, the farmers face a risk about a stable price.

Twenty-eight percent of the farmer responses revealed that rapidly fluctuating buying prices during the harvesting season is an issue.

Another commonplace problem 19 % of the farmers have to grapple with is that they are compelled to market their paddy at any price soon after the harvest because of the urgency to settle their bills for hiring harvesting machines and ploughing tractors. The millers in the area too organize themselves and make a concerted effort to pressurize the resource poor farmers to part with their paddy harvest at low prices. Among other problems they highlighted the need to payments to the brokers, reduce the purchasing price according to the moisture content and not receiving the poly sack bags.

CHPTER SIX

Summary, Conclusion and Policy Recommendations

6.1 Findings

i. The literature provided two different approaches in grain procurement system; one emphasizes greater participation of government through public buffer stocks, buying and selling operations through government bodies. The other thrusts on involving the farmers and the private sector in the stock business under certain control and support from the government. The parastatals operating in most of the countries tend to implement various alternative market based strategies to increase the efficiency of such intervention programmes for reducing the adverse impacts to the government.

ii. Out of the total sample (n = 345), nearly half of the farmers (48%) depended only on private sector paddy purchasing schemes, whereas the corresponding figure for the government sector was only 14% and those who selected both are 38%. Randomly selected farmers' representation is as follows. According to the results there were 167 farmers who solely relied on the private marketing channels like the rice millers and the collectors. Only 48 farmers opted for the government marketing channels. This is mainly due to their selling quantity not exceeding 2,500kg which is the maximum limit of PMB purchasing quantity for a season per farmer. Furthermore, 130 farmers selected both the private and the government marketing channels. Their first choice was the PMB stores and the rest of the surplus sold out to the private sector. Therefore, nearly 52% of the sample farmers selling their paddy to the PMB shows popularity of the government purchasing programme in major producing areas. The average paddy land cultivated in the Maha season is in Anuradhapura, Ampara, Polonnaruwa and Batticaloe is 3.41 ac, 3.50 ac, 3.09 ac and 4.80 Acers respectively.

iii. The logistic regression analysis indicated that the distance to Paddy Marketing Board purchasing center have reported positive values, thus affected positively and significantly for the selection of Government Paddy Purchasing Programme (GPPP). Positive significant coefficient of 'Distance to paddy marketing board center' reflects that, even if a selected farmer is residing far from the PMB center, he or she is more inclined to select GPPP. This is mainly because in peak harvesting months like February to March the price gap between the open farm gate price and price offered by the PMB centers is comparatively different. PMB centers offer more price premium than in the open market and in some cases this was more than Rs.10.00/kg. Therefore, regardless of distance farmers tend to select the PMB stores.

iv. In present study, “Quantity of wet paddy sold” is the variable which indicates negative and significant impact on selecting GPPP. It points out that if “Quantity of wet paddy sold” increased by one unit, on average the estimated log likelihood value decreases by 0.0002, signifying a negative relationship between selection of GPPP and the considered variable. It means if a particular farmer tended to sell higher quantity of paddy as ‘wet paddy’ he or she is less likely to select GPPP.

v. In addition to that, the average lowland land extent of farmers negatively significant. This means when the average land extent is lesser, then the farmers tend to opt the PMB centers. In general, PMB centers purchase only 2,500 kg of paddy from a farmer. This also results small scale low land farmers to sell their paddy for the government channels. This means there are more opportunities in government paddy purchasing channel for small scale farmers who produce limited surplus of paddy.

vi. Study also found that, from the total farmers 40% have obtained any type of loans for agricultural purposes. Further, 55% of farmers have pawn their jewellery to obtain money for agricultural purposes. This indicates the indebtedness level and credit binding nature of paddy farmers. Literature also suggests that, there is a limited choice for such farmers.

vii. Previous research during the last three decades found that the farm income of paddy farmers deteriorated over time mainly due to the continuous rise of production cost, low paddy prices and a significant increase in the prices of consumer goods over time. This had resulted in a decline of living standards and the wellbeing of the farmers. The present study also found that the income of the majority of paddy farmers was not satisfactory especially in Ampara district.

viii. Wasting time and money, ineffective buying process, strictly quality checks of paddy, lack of sufficient storage facilities, delaying of the commencement of purchasing and lack of drying facilities are the major problems faced by the farmers when they dispose of their paddy to the government PMB stores.

ix. The major problem highlighted by the farmers when selling paddy to private sector is inability to receive a fair price. Farmers point out that the private sector uses various ruses to purchase paddy at low prices as much as possible especially in the harvesting season. This situation was brought into sharper focus by the farmers in Anuradhapura and Ampara districts. They mentioned that the collectors and millers use fake measuring devices.

More than 50% of the farmers not satisfactory with and disagree to the existing private sector dominated public sector intervening paddy purchasing system. The farmers

empathized with the need of a village level agent mechanism to sell their paddy to the PMB. They are well contented with the suggested dual guaranteed pricing method based on paddy quality and with the extension of present ware house receipt financing method in all major producing areas. However, the study observed the lack of information related to available stocks in the ware houses in a particular website or other media for the use of the buyers in Anuradhapura and also in Mannar.

6.2 Conclusion

Increasing market participation among smallholder paddy farmers has the potential to lift them to better income levels through increased productivity and surplus production. Previous research during the last three decades found that the farm income of paddy farmers deteriorated over time mainly due to the continuous rise of production cost, low paddy prices and a significant increase in the prices of consumer goods over time. This had resulted in a decline of living standards and the wellbeing of the farmers. The present study also found that the income of the majority of paddy farmers was not satisfactory especially in Ampara district. The study brought light to the farmers' the willingness towards government paddy purchasing programme over the private channels. Specific reasons are differences in the price premium in purchasing channels which are higher in the government channels in the peak harvesting seasons. Generally, farmers who have difficulties in finding safe storage facilities, suitable places and required labour to dry paddy up to the standard level and those who have immediate cash needs to settle credits are more likely to give their first preference to the private sector. Further large scale farmers too show a tendency to sell their paddy to the private sector. As short term the Guaranteed Price of paddy should be increased up to Rs 50.00/Kg or more to improve the income and well-being of paddy farmers. It is a long term need to create agricultural as well as nonagricultural opportunities in main paddy farming oriented rural DS division areas. Re-assess the role of the present private sector led and public sector intervened paddy marketing system, which would lead to reform both public and the private sector involvements. At the same time more market based strategies like Ware House Receipt Marketing (WHRM), Deficiency Price Payment System, Public Private Partnerships to reduce the financial burden to the government can be implemented. Information sharing is of paramount importance to the proper functioning of the WHRM system. Public - private sector partnership is an indispensable situation to explore the probability of having modern mills with state of the art technology, in paddy surplus producing rural areas especially in Ampara, Batticaloa and Anuradhapura. This would lead to enhance the quality of paddy, livelihood of paddy farming community as well as to reduce market distortion.

6.3 Policy Implications

i. As short term the Guaranteed Price of paddy should be increased up to Rs 50.00/Kg or more to improve the income and well-being of paddy farmers. It is a long term need to create both agricultural and nonagricultural opportunities in main prominent paddy farming rural DS division areas especially in Ampara and Batticaloe districts. For example, the suggested export oriented Sweden based Agro pharmaceutical product manufacturing industry (Starch Industries (Pvt) Ltd) using organic manioc in Welikanda area in Polonnaruwa district will create more cash income and other agricultural opportunities for a large number of farmers. In addition to focus for establishment of nonagricultural industries in those areas like export oriented garment manufacturing. Those measures contribute to enhance the economy of paddy farming households.

ii. Similarly, government should be encouraged the establishment of modern private sector mills in major paddy surplus producing rural areas especially in Ampara, Batticaloa and Anuradhapura. The medium scale success millers should be encouraged to upgrade their milling industry especially in above mentioned surplus areas.

iii. The application of Information Communication Technology (ICT), should be promoted so as to enhance the efficiency of PMB paddy purchasing and distribution programme. As an initiative creating a website and feeding the farmers information into that website can be done. Using ICT in all storage transactions and which will mitigate the leakages and diversion of funds and enhance efficiency. Lessons can be learnt from paddy procurement programme of Chhattisgarh State Government of India. Implementing drying yard facilities in procurement centers would help procure paddy just after harvesting. Duration of procurement period should be increased.

iv. The newly introduced warehouse marketing receipt system shows promising results therefore, can be promoted. Information sharing is of paramount importance to the proper functioning of this Ware House Receipt System (WHRM). Warehouses should offer the price, supply and demand information to the market users so as to develop selling and buying strategies. Therefore, the establishment of a robust system for sharing of information, is necessary in presently operated warehouses like those at Anuradhapura and Mannar to enhance the efficiency of the system. Due to wild elephant threats the farmers in these areas tend to sell the paddy soon after harvesting without keeping it stored. This situation can be avoided by promoting WHRM system through which the farmers are provided safe storage away from their houses and assured income.

v. A monitoring mechanism of producer prices of paddy at Divisional Secretaries (DS) level especially during the peak harvesting season need to establish. Implementing drying yard facilities in procurement centers would help procure paddy just after harvesting. Duration of procurement period should be increased. It is recommended to implement a mechanism to provide proper and quality drying yards giving emphasis to the areas which have severe needs of them. For this purpose, the private sector can also be encouraged. Therefore, necessary steps should be taken to implement these programmes through both public and private sectors.

vi. In India guaranteed price differs according to the quality of paddy. The standards related to the normal paddy and grade A paddy are defined by the Commission of Agricultural Costs & Prices of India. According to the standards, Food Corporation of India (FCI) procures paddy from the farmers and the millers. The grading system encourages the farmers to produce quality paddy. Introducing this type of system by the PMB leads to minimize the market distortions. Meanwhile country need a sound mechanism for the pricing policy of paddy and rice.

vii. Another viable solution is to re-assess the role of the present private sector led and public sector intervened paddy marketing system, which would lead to reform both public and the private sector involvements. At the same time more market based strategies like Ware House Receipt Marketing, Deficiency Price Payment System, Public Private Partnerships to reduce the financial burden to the government can be implemented.

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