

## DOES THE NATURE OF PADDY MARKET STRUCTURE MATTER FOR POOR EARNINGS OF PADDY FARMING? A CASE OF HURULUWEWA COLONIZATION SCHEME IN SRI LANKA

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### 1. BACKGROUND

After regaining independence, the government and private sectors in Sri Lanka played a significant role in paddy marketing network. Mainly two government institutions—the Paddy Marketing Board (PMB), which was established in 1971 targeting the realization of the Guaranteed Price Scheme (GPS) and supplying rice to the consumer at an affordable price, and Multi-Purpose Cooperative Societies (MPCS) handled a major share in the purchasing of paddy at a guaranteed price. The GPS was initially introduced with the objective of boosting farmers' income by offering them an assured price to protect them from middlemen.

In the early 1980s, the International Monetary Fund (IMF) and the World Bank advocated the government of Sri Lanka to undertake market-oriented policy reforms in the economy, including agriculture, under the Structural Adjustment Program (SAP). The main argument drawn on this was that government operations in agricultural marketing (input and output markets) are not effective and efficient, and do not support to promote the interest of farmers and consumers. In every harvesting period, farmers in the main paddy producing areas of the country have reported the difficulties in selling their paddy harvest at a price of GPS due to the issues related to government paddy purchasing mechanism (Colombopage, 2011). Through the market-oriented policy reforms in

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agriculture, it was expected to increase the market competition and thereby intended to increase producer price (producer welfare) and stimulate agricultural growth and income. With these policy reforms, the significance of the PMB and MPCs in paddy marketing was reduced due to the competition from the private sector (Prasanna, 2006). For example, during the 1980s, the open market price of paddy exceeded the guaranteed price, rendering the government paddy purchasing institutions as financially unviable (Weerahewa, 2004).

It is most likely that market-oriented policy reforms on Sri Lankan paddy sector have widened the gap in market power between small-scale farmers and large-scale traders. The reason is that the significance of the PMB brought down in realization of GPS in the paddy marketing due to the competition of private traders and structural issues in the government paddy purchasing mechanism in the early stage of liberalization. The government bureaucracy, political intervention in purchasing system, corruption, low efficiency in the purchase of paddy and distribution of rice compared to the private sector, extra cost on documentation and transportation, high risk of contingent on rejection were well contributory factors which increase the vulnerability of the PMB (Prasanna, 2006). As a result, the difference between *farm gate price of paddy* and retail price of rice has widened dramatically. The *farm gate price of paddy* has remained low, leading to reduced income for paddy farming, particularly at the harvesting period. According to JICA (Japan International Cooperation Association), from the total paddy/rice trade, about 90 percent is handled by the private sector value chain players while the public sector accounts for the remaining 10 percent (Senanayake & Premaratne, 2016).

The studies cited numerous reasons for the widening gap between producer price and consumer price, and thereby poor earning from paddy farming. Among these reasons, the oligopolistic nature of traders and less involvement of government sector in paddy marketing activities are the decisive reasons (Prasanna, 2006). Hence, today, paddy farming has become an economically unviable sector, leading to indebtedness among the farmers (Irshard & Thiruchelvam, 2006), and the government has to spend more to subsidy programs and other supportive programs to protect the paddy sector due to its importance concerning national food security; it provides approximately 50 percent of the daily calorie intake of the households with 45 percent of per capita protein requirements, and livelihoods of many farmers. For instance, the government allocated Rs. 37,500 million for fertilizer subsidy program in 2016 (Central Bank of Sri Lanka, 2016). Further, the government attempted were noticed in materializing the GPS at the paddy market through various ways during last few decades. These facts indicate that paddy marketing problem is still among the key issues in paddy sector hence it implies the needs of new research in the field in order to extend the knowledge or understanding

on whether paddy marketing issue is a matter of poor earnings of paddy farming in Sri Lanka. Specifically, two questions are yet to be sufficiently answered; 1) What are the root causes that paddy farmers are pushed to sell their harvest at relatively low price immediately after the harvesting? and 2) How do private traders exploit the paddy farmers during harvesting period offering relatively low price? At present, from over 1.8 million paddy farmers, the majority of small-scale farmers own less than 1 ha. of land and are primarily dependent on rice farming (Weerahewa, 2004).

In this context, it is questionable whether the nature of paddy market structure is a matter of poor earnings of paddy farming. Thus, the main aim of this paper is to study the nature of the problem of poor earning of paddy farming, paying particular attention to the paddy marketing channel in the major colonization schemes in Sri Lanka. The paper will focus on the following points: 1) Analysis of cost and income of paddy farming, 2) Examine the nature of the paddy marketing channel, 3) Analyze the effects of existing paddy marketing structure on farmers' production and marketing conditions, and 4) Suggest the ways to correct paddy marketing problems by empirically conceptualizing the paddy marketing problems, solutions, and challenges.

## **2. LITERATURE REVIEW**

Rice is the staple food of Sri Lanka, and paddy farming is the livelihood of approximately 1.8 million farm households. Hence, the subject of paddy marketing problem acquires wider interest from the scholars due to its negative implications to the food security of the country. However, the existing state of knowledge in the field does not provide sufficient information to address the problem sustainably because the investigations rarely outline the root causes of the paddy marketing problem.

Damayanthi (2006) researched the issues related to paddy marketing in Polonnaruwa district in Sri Lanka to identify problems and hardships faced by participants in the paddy marketing channel. For this study, she collected primary data from 500 farm households, 38 intermediaries, and 38 rice millers in the paddy marketing channel. The results revealed that 95 percent of farmers who sell their harvest to government paddy purchasing centres face problems due to quality checking, delay in payments, delays in marketing, issues related to packing and transportation, inefficiency and corruptions in paddy purchasing mechanism, and the distant location of paddy purchasing centres from urban areas. The results also report that 85 percent farmers who sell their harvest to private sector confront problems due to the low price, issues related to scaling the harvest, and the control of paddy price fixing mechanism by few buyers.

By analyzing economic gains of paddy farming in Sri Lanka, Henegedara (2006) emphasizes that less competitiveness in paddy marketing during the harvesting period is the reason for farmers having a reduced price for paddy. According to the results, private traders in paddy marketing channel determine the price, which is mostly less than the guaranteed price established by the government. Although farmer companies, Cooperative Societies, and SATHOSA are involved in paddy marketing, they are unable to support farmers to obtain the guaranteed market price since they are less capable of handling the market risk. The researcher presumes that this situation will become worse in future paddy marketing, with Sri Lanka agreeing to the World Trade Organization (WTO) policies.

Weerahewa (2006) analyzed the household welfare impacts of alternative liberal and protectionist policies related to rice sector. The study employed the General Equilibrium Framework to frame the study objectives, and the results revealed a positive relationship between liberal policies, and economic efficiency and household welfare across provinces. The findings suggest that liberalization would allow paddy farmers to be more competitive in an environment of large holdings managed by entrepreneurial farmers. The study further suggests that liberalization might also lead to land consolidation, vertical integration, value addition, and product diversity; and consequently, a movement away from the semi-subsistence state to a commercial enterprise.

Senanayake and Premarathna (2016) examined the competitiveness and efficiency of paddy/rice market in Sri Lanka by employing tracer survey methodology. As per the results, the profit margins of the players in the paddy/rice marketing channel are not excessive compared to average bank lending rate of 15% in 2012. Findings further prove that paddy/rice value chain is economically efficient. The authors emphasized less evidence on the exploitation of rice producers and consumers by the rice millers and wholesalers using oligopolistic practices.

Hilal and Mubarak (2013) studied rice marketing environment and suggested mechanisms for marketing Sri Lankan rice locally and internationally. The findings highlight that the attempt of exporting rice by the government was unsuccessful due to the low quality of rice and issues related to international business strategy. The study emphasizes the importance of promoting Sri Lankan varieties in the international market as a business strategy and educating the entrepreneurs to produce value-added rice to support the farmers and millers to sell their paddy and rice at a reasonable and competitive price.

Review of the available limited number of studies on the research subject reveals that the investigations have not adequately documented the specific

characteristics of rice marketing channel, root causes that farmers are pushed to sell their harvest at relatively low price at the harvesting time, and factors affect private traders to exploit the paddy farmers during the harvesting time. Regarding rice market liberalization, the studies provide rather mixed results. Thus, the primary focus of the present study is the identification of characteristics of paddy marketing structure in the country and investigating the causes that induce low farm-gate prices during the paddy harvesting period.

### 3. MATERIALS AND METHODS

In order to deal with the research subject, data for analysis was drawn from two field surveys—farmer survey and survey on traders in paddy marketing channel—in the *Huruluwewa* Major Colonization Scheme (HMCS) area in January / February 2018. The HMCS was selected for several reasons:

- a. This scheme is one of the main paddy producing colonization schemes, which was established in the late 1950s in the North Central Province in Sri Lanka. The *Huruluwewa* reservoir was built by king Mahasen (275-301 AD). In 1934, the tank was rehabilitated by the British period and developed as an agricultural colony in the late 1950s (Loeve, et al., 2003). Originally, 3,800 families were settled and 8,936 acres were distributed among the settlers for paddy and highland farming (Loeve, et al., 2003).
- b. The scheme has a long history in producing and marketing paddy as it was established in the late 1950s. Specifically, the farmers in the scheme have experiences in both paddy marketing channels – PMB-led and private sector-led paddy marketing channels.
- c. It was observed that farmers in the scheme face for many difficulties in paddy farming and marketing.

The field sites were selected considering both right-bank and left-bank of the HMCS. Further, thirteen *Grama Niladari* (GN) divisions were selected representing both banks for the farmer survey. A pre-tested, semi-structured questionnaire was employed in each survey to gather the data on socio-economic background of paddy farmers, paddy production, characteristics of paddy marketing channel, and nature and functions of participants in paddy marketing channel. The questionnaires were developed by taking into account the existing knowledge in the field and initial discussions with stakeholders. Pilot test was performed to observe respondents fatigue on draft questionnaires and then revised the questionnaires accordingly. Hundred-and-ten (110) farmers in the right-bank and left-bank of the HMCS were selected for the study by giving equal probability to all farm households in sampling. The farmers with more than 10

years of farming experience were selected for the farmer survey. In addition, 20 traders in the paddy marketing channel, officers in the government paddy purchasing centers in the area, and leaders of farmer organizations were interviewed to gather data on paddy marketing channel in the area. The collected data were analyzed using a descriptive statistical method, specifically using the average values, percentage values, variance and standard deviation, ranges etc.

#### 4. RESULTS AND DISCUSSION

##### 4.1 Cost-income analysis of paddy farming

The socio-economic profile of the surveyed sample revealed that almost all farmers are smallholders with a mean farm size of 1.8 acres. Mean age of a farmer is 54-years with 32 years of farming experience. It implies that most farmers are in the middle age, economically active, and experienced in farming. It also denotes that farming has become less attractive to the young. All farmers use their own lands for paddy cultivation.

Table 2 presents the analysis of average cost and income of paddy farming in the survey area. It shows that farmers earn a net income of Rs. 12,989 per acre by spending Rs. 42,575. As the average farm size in the area is 1.8 acres, the total net income and total cost of average farmer in the scheme are Rs. 23,380 and Rs. 76,635, respectively. Thus, the net income cost ratio in the area is 0.30. Moreover, the gross income cost ratio in the area is 0.76. It indicates that cost of production and unit price of paddy are the contributory factors which determine the net income paddy farming in the area.

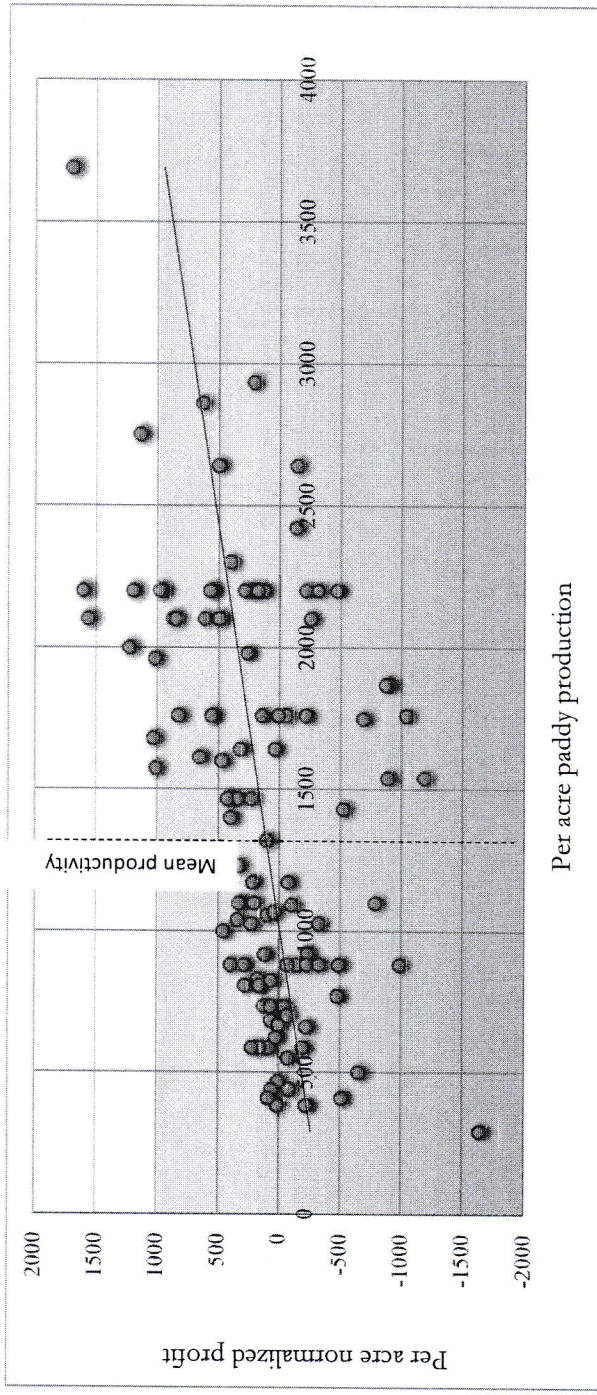
Average selling price of paddy in the concerned season of the study was Rs. 39 and only 47 (42.7%) farmers could sell their produce at the above the average price. However, the distribution of farmers' net income revealed that 37 (33.6%) farmers did not receive the deserving positive net income (see Figure 1).

Figure 1 illustrates a positive relationship between farm productivity and per acre normalized profit. The normalized profit per acre of paddy land was measured by dividing the profit by the price of output (price of paddy). The results further designate a negative relationship between farm size and paddy productivity, indicating declining farm productivity when farmers increase the land scale of farming. This finding contradicts with other studies that encourage farmers to increase the land scale to get economies of scale. The possible reasons explained by the farmers for the negative relationship between farm size and productivity are water management issues at the field level frequently faced by the farmers due to drought, and the problems of irrigation water management by the Irrigation department at the scheme and prevailing labor shortage.

**Table 1: Average cost and income of paddy cultivation in the survey area (per acre): 2017**

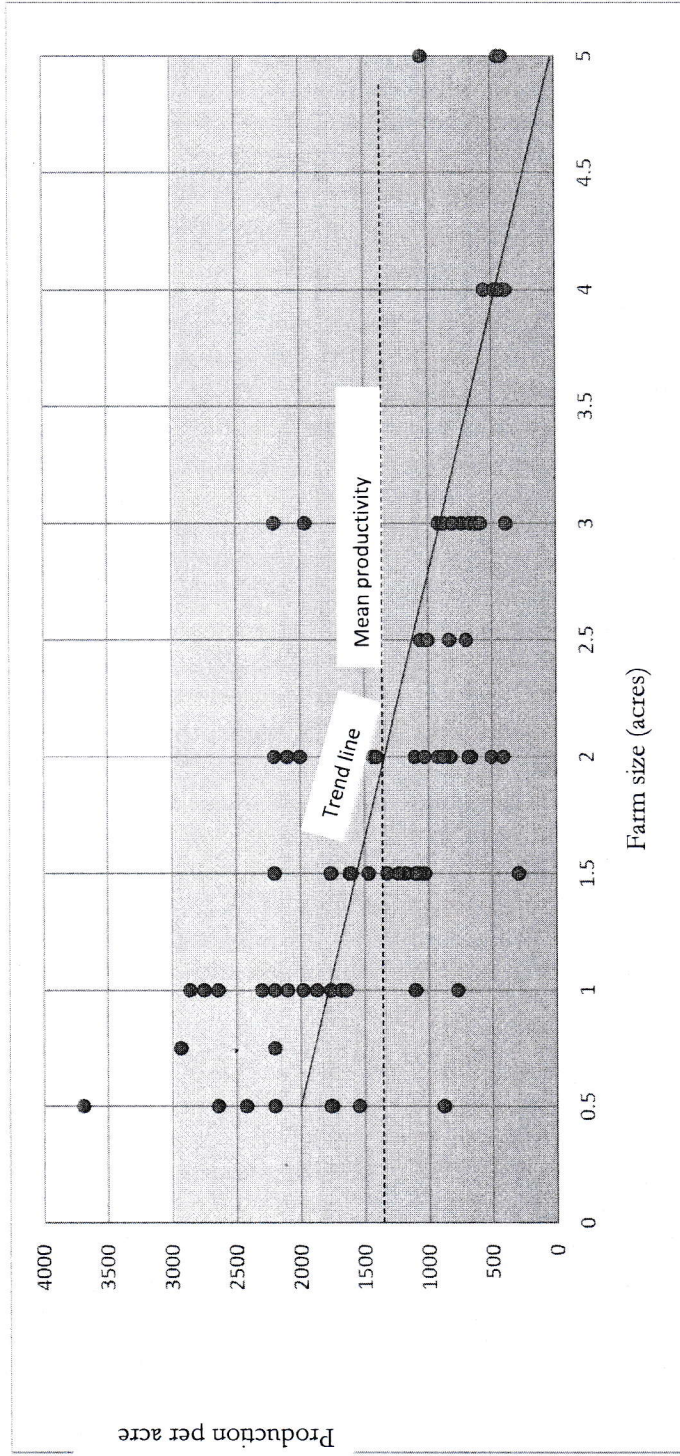
Variable	Sub-variable	Average value	Min.	Max.	St. Dev.
Cost	Labor cost (family labor + hired labor)	15,742	10,564	50,700	8373.1
	Machinery cost	13,446	0	44,000	7,722
	Input cost (seed cost, fertilizer cost, pesticide cost, herbicide cost)	11,379	903.4	37,268	7,657.1
	Packaging cost	991.9	0	3,500	782.4
	Transportation cost	1,016.3	0	5,000	994.0
Cost per acre	Production cost per acre	42,575	11,414	100,760	22,151
Gross income	Production per acre (kg)	1,429.6	293	3,690	704.0
	Price per kg of paddy (Rs.)	39.35	23	55	7.7
	Total gross income per acre (Rs.)	55,564	8,800	166,050	28,276.9
Net income per acre (Rs.) (including fertilizer subsidy)		12,989			

Source: Authors' calculations based on field survey data



**Figure 1: Relationship between per acre paddy production and per acre normalized profit**  
 Source: Author's illustration





**Figure 2: Relationship between land size and farm productivity**

Source: Field survey, 2018

#### 4.2 Nature of paddy marketing structure

Figure 3 depicts the structure of the paddy marketing channel in the survey area. Several village-level assemblers were reported in one village. The capacity of storage facilities of interviewed assemblers at the village level varied from 11,000 kg to 200,000 kg. Most of them had zero transportation cost because usually, the farmers transport their harvest from farm to the assembler's place. Most assemblers had their own small stores, and some had concrete compounds for drying the wet paddy.

However, the assemblers do not hold the collected paddy for a long time, and 80 percent of them kept 50 cents from each kilogram as their profit. They usually find the capital for buying paddy by their own capital or savings, pawning jewelry or registration certificates of their vehicles and obtaining a short-term loan from the banks.

The main feature of the channel is the hierarchical relationship between participants in the marketing channel based on the market share (see Figure 3). It shows that paddy market in the area is dominated by few large-scale traders directly via their agents, who find the required paddy procurement finance from large-scale traders and indirectly through village-level assemblers. At the village level, 67 percent and 15 percent of farmer products are channeled through village-level assemblers and agents of large-scale traders, and a proportion of 80 percent and 100 percent of assembled products are then shipped to large-scale traders by the village level assemblers and agents of large-scale traders respectively. Twenty percent of assembled paddy by village level assemblers is then shipped to private rice millers in nearby cities, *Galenbindunuwewa* in the survey area. The nature of these private rice millers are differ from large-scale traders because they operate their business within a limited geographical area and do not have an influential power to determine the paddy price at the market as large scale traders.

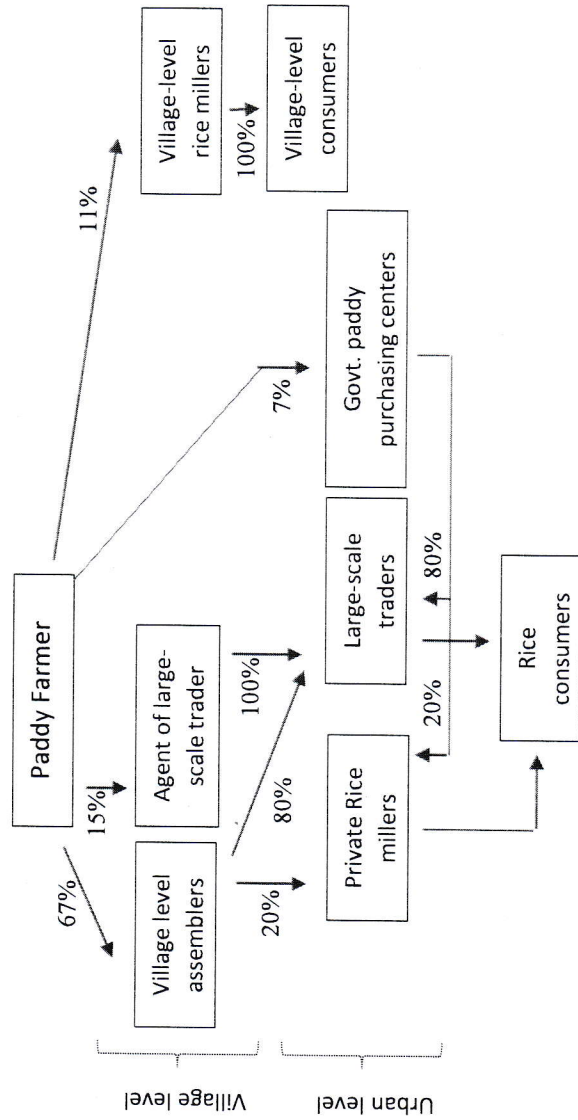
The government purchasing mechanism has only purchased 7 percent of production in the area, from which, 80 percent have been directed to the large-scale traders, particularly at the off-season. Even though, this assembled 7% of paddy by the government purchasing mechanism is a buffer stock system, which is a system that buys and stores stocks at the paddy harvesting time to prevent price falling, release of 80% of assembled paddy to the large scale traders at the off-season results to further strength paddy/rice market operation of large scale traders.

Thus, it finally indicates that 74.2 percent of the products sold by the farmers is handled by a few large-scale traders, particularly in the region. These assembled paddy by the large-scale traders are ungraded and unprocessed; thus,

they undertake marketing functions—finance of paddy procurement, transportation, storage, processing, rice distribution, and price determination at the farm level. Thus, these traders obtain economies of scale in the paddy market operations over a high level of operational capital (cash) along with a comparatively large area of operation.

The interviews with village-level assemblers revealed that they had to dispatch their assembled paddy to large-scale traders because generally they are provided with price information with assured forward market. They play a role as commissioned agents. According to traders' interviews, large-scale traders primarily determine the *farm gate price of paddy* through their market power and experience in the paddy marketing channel. Before determining the paddy price at the farm gate level, these few traders analyze the supply side and demand side factors as well as review and forecast possible changes of government policy over rice marketing. Thus, it is posited that there is ***an oligopolistic market structure*** for paddy in the survey area since large scale traders handle significant proportion of farmer products and primarily determine the *farm gate price of paddy*.

Further, the study identified the entry barriers that new traders meet at the paddy market. Specifically, the historical profile of large scale traders in the NCP revealed that the business expansion of them is an evolutionary process of over 30 years. They have started their paddy marketing operations in the early 1980s at a level of small scale in the region. Thus, their experience in behavior of price of paddy at the harvesting time, understanding about farmer related issues—particularly financial issues at the harvesting time—, relation with village level paddy assemblers, and experience and understanding about government paddy marketing policy related issues are comparatively high. Also, a high level of operational capital (cash) and large scale of production operations of these traders have provided an opportunity to gain economies of scale from the paddy business. These facts have limited the competitiveness of paddy market in the area.



**Figure 3: Nature of paddy marketing channel in the survey area**  
 Source: Field survey, 2018

### 4.3 Effects on farmers' production and marketing

The previous analysis revealed that large-scale traders in the paddy marketing handle all functions of marketing including product assembling through village-level assemblers and the agents, grading, transportation, storage, processing, and price determination.

Pre-modern economic characteristics still exist in the marketing structure. For instance, assemblers use credit provisions as a strategy to maintain product supply, which in turn reduce the farmers' negotiation power. In the survey, 31.8 percent of farmers reported that they had to sell their paddy produce at the harvesting time, the period when paddy price is at the lowest level, to repay the loans borrowed for paddy farming (see Table 3), particularly provided by the local traders. Though they are not asked to pay any interest on the received loan, they are obliged to supply the harvest at a price offered by the traders during the harvesting period. These farmers report that they have to accept the trading terms bidden by the traders due to their weakened negotiation power. The interviews with leaders of farmer organizations revealed that they are not undertaking paddy marketing related functions and main task of them is to manage water related issues in the scheme.

Moreover, as the majority of paddy farmers are in the low-income circle due to the inadequate derivation of surplus income, they are further pressurized by the variable costs of paddy farming to sell their products at the harvesting time though prices are minimal. This was reported by 33.6 percent surveyed farmers (see Table 3). Most farmers use agricultural machineries for land preparation and harvesting on the basis of paying the cost after selling the harvest. Thus, the farmers have to sell their crop within a shorter period between the harvesting time and before the onset of next cultivation season. These factors—informal credit provisions, pressure of variable cost to sell harvest at the harvesting period, and no derivation of adequate income surplus and thereby in the low-income circle—have created the opportunity to exploit and dominate the paddy market by the private traders, and thereby create an **oligopolistic market structure** in the paddy sector. Thus, revealed characteristics of paddy market in the area indicate that farmers' marketing power is getting weaker and does not support the majority of farmers to generate surplus income from paddy farming.

**Table 3: Reasons for selling output at the harvesting time**

Reason	No. of farmers (N = 110)	%
To repay the loan borrowed for the paddy farming	35	31.8
To pay wages for labor cost, input cost, and machinery cost of paddy farming	37	33.6
To repay the loan borrowed for other reasons	9	8.1
Emergency needs	2	1.8
Due to pest attack	2	1.8
Insufficiency of storage facilities	0	0.0
No specific reasons	25	22.7

Source: Field survey, 2018

#### **4.4 Conceptualization the nature of paddy marketing problem from farmers' perspective, and solutions and challenges**

Figure 4 presents the nature of paddy marketing problem from farmers' perspective. It illustrates three demarcating price points—A = minimum price at the harvesting time, B = average price of the surveyed sample, and C = maximum price—along with selling weeks of paddy harvest.

The results showed that 63 (57.2%) farmers are selling their harvest before eight weeks (between A and B) after harvesting (or before the next cultivation season) at a price below the average. The pressing concern of this matter is that this leads to the less income in paddy farming (even a loss). As depicted in Figure 1, there are 16 (14.5%) farmers in the negative net income area because of selling the harvest at the harvesting period, even though their farm productivity is above the mean productivity in the area.

Figure 4 further shows a significant price difference between paddy harvesting time and off-season (17 weeks from harvest). This finding questions—why do large price difference between paddy harvesting time and off-season not encourage holding stocks by the farmers in the area? According to the study findings, the farmers' severe financial hardships at the harvesting time and dependency on informal credit sources, adopted marketing strategies by the traders at the harvesting time, and traditional or irrational behavior of farmers in selling harvest are the possible explanations for not holding stocks to gain benefits selling harvest at the off-season. According to interviews with leaders of farmer organizations in the survey area, the farmer organizations are not in a position to undertake paddy market related activities owing to less financial capacity and less business management experiences.

The nature of market domination by few large scale traders in the NCP during the harvesting time can be explained by taking into account the findings of both farmer's and trader's surveys. The study identified causes that influence paddy farmers to sell their harvest in between the harvesting time and the beginning of next cultivation season (between A and B). Less financial capability to cover the cost of production within a cultivated season and debt trap laid by the village-level paddy assemblers are the critical factors which limit farmers movement to higher price region (between B and C). Continuation of these issues leads to further expand the market power and business scale of few large-scale traders in the region. Moreover, large scale traders undertake all marketing related functions such as finance of paddy procurement, transportation, storage, processing, rice distribution, and price determination at the farm level, and thereby obtain economies of scale in the paddy market operations.

The second hypothetical option farmers have is the move to point D from point A at the harvesting time. It will address the issue of credit strategy laid by the traders and financial issues faced by the farmers while allowing them to move out from a low-income circle or generate surplus net income. Realization of this price can be accomplished through expansion of government paddy purchasing mechanism, extending the functions of farmer organizations or farmer cooperatives towards paddy marketing, processing and distribution, and regulating the market prices.

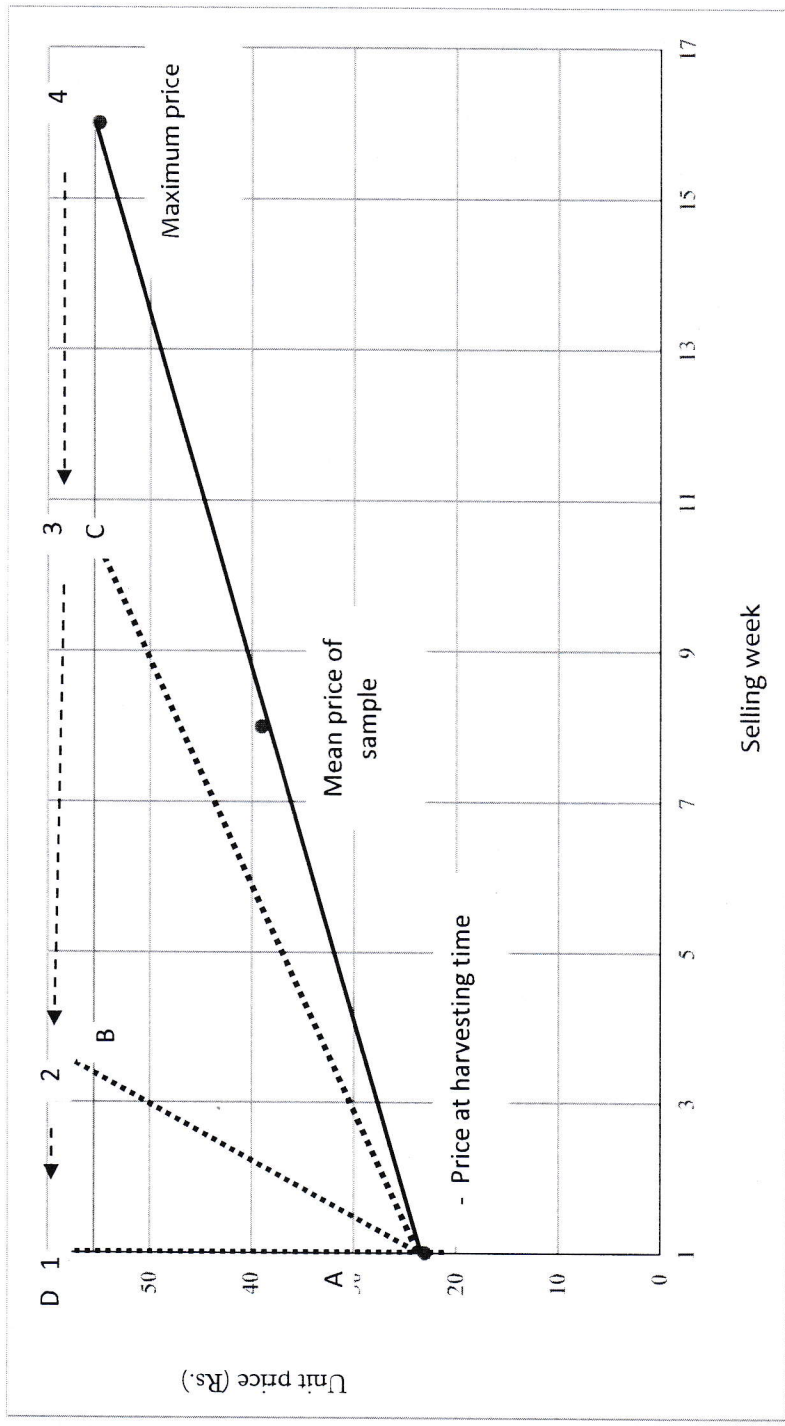


Figure 4: Conceptualization the nature of paddy marketing problem from the side of farmers, solutions, and challenges  
 Source: Author's development



## 5. CONCLUDING REMARKS

The primary aim of this study was to investigate the nature of paddy marketing structure in the main colonization schemes in Sri Lanka, to understand whether it matters for poor earnings of paddy farming. The results indicated that paddy farmers do not derive adequate net income from paddy farming, and a majority of farmers sells their harvest in the harvesting period at a lowest price; this does not support them to cover the cost of production adequately.

Further, the oligopolistic market structure in the paddy marketing in the area was revealed by the study as few large-scale traders handle a large share of farmers' production. The lower financial capability of the farmers to cover variable costs of paddy farming and pre-modern economic characteristics of paddy marketing channel have created the place for large-scale traders to grab the farmers' production at a minimum price during the harvesting period. Farmers do not receive any service from these traders regarding price information, inputs supply, credit provisions, or assured market for them at a reasonable price. The study also found the entry barriers that new traders face in the paddy/rice marketing in the region. These barriers are the large scale traders extensive experience in behavior of paddy/rice marketing channel particularly at the harvest period, well understanding about the farmer issues—specifically the financial needs around the harvesting period—, long term connection with village level paddy assemblers, experience and understanding about the paddy/rice marketing policy specifically during harvesting and off-seasons, and relatively high level of operational capital (cash) and large scale production operations. It indicates the ineffectiveness of market related policy reforms in enhancing the efficiency in paddy/rice marketing channel. As revealed by the analysis, one of the reasons for selling the harvest at the harvesting time is the financial needs. It indicates the deficiency or ineffectiveness of government policy in addressing the financial needs of paddy farmers in and around the harvesting period has provided space for large scale traders to grab the farmers' paddy harvest.

The study found less involvement of the government in paddy marketing and zero involvement of farmer organizations and agricultural cooperatives in paddy marketing activities, though they provide agricultural extension services, inputs (managing the government subsidy programs), irrigation water management, and other farm-related services.

This study further encourages deep studies in this field, particularly to answer the questions— why do farmer organizations / agricultural cooperatives not involve in paddy marketing and what are the policy level and institutional level issues in addressing the farmers' financial needs in and around the harvest

period. Those studies will further extend the existing knowledge in understanding causes of poor earnings of paddy farming in Sri Lanka.

In conclusion, it is evident that the market-oriented policy reforms have not supported to improve the market competition in the paddy marketing and enhance the welfare level of paddy producers in the scheme. Thus, immediate measures should be taken to address the marketing-related issues faced by the farmers in main paddy growing areas of the country.

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