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APPLICATION OF TRANSACTION COSTS ECONOMICS TO EXPLORE THE OPPORTUNISM, ASSET SPECIFICITY, AND UNCERTAINTY RELATED ISSUES AND CHALLENGES FACED BY THE MILLERS IN SRI LANKA.

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Abstract: The issues experienced in the Sri Lankan rice industry can be addressed through transaction cost economics (TCE) theory. Therefore, descriptive research with an epistemological perspective was conducted to examine the applicability of TCE to explore the root causes of the issues and to identify challenges. Focus group discussions, interviews with the main stakeholders, and a questionnaire survey were conducted. The results suggested the ineffectiveness of certain policy implementations due to the opportunistic actions of key players in the industry or key players taking an opportunity to manipulate the market was the root cause. Hence, the government intervention is to be strengthened to enable the market forces to decide the equilibrium price and supply. Personal biases of respondents might be a limitation and proposed new strategies for successful policy implementation. The novelty in this study is the use of TCE which has not yet been studied in the Sri Lankan context.

Keywords: Asset Specificity, Bounded Rationality, Opportunism, Transaction Costs Economics

JEL Code: D 21, D 23

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I. INTRODUCTION

Rice is the staple food for more than half of the world's population, contributing to milled rice production of 503 million MT in 2022 (Shahbandeh, 2023) and approximately the livelihood of 3.6 million farmers with their families engaged in Sri Lanka (Wijesooriya *et al.*, 2021, p.1). Most researchers, therefore, pay much attention to the performances of the industry and every successive Government gives prominence to the allocation of resources in the sector (Wijesooriya *et al.*, 2021).

Determination of the price of paddy and rice in the market is associated with seasonal availability, meanwhile, during the harvesting period, farmers criticized that they were unable to sell paddy at a fair price (Prasanna, 2019; Wijesooriya *et al.*, 2021) might be due to the farmer-specific, location-specific transaction cost as stated by Pingali *et al.*, (2005), limitation of searching information on market price and demand as well as the limited analytical capacity of human which is explained in bounded rationality in Transaction Cost Economics (TCE) by Williamson (1985). In addition, the opportunistic action of purchase agents also influences lower market prices for the farmer.

During the off-season, the price of rice becomes higher causing inconvenience to the consumers (Wijesooriya *et al.*, 2021). Scholars (Prasanna, 2018; Thibbotuwawa, 2021) commended, that a few large-scale leading mill owners influence the market with their significant market share, paddy storage, sophisticated technology, easy access to credits, and political patronage causing artificial creation of rice scarcity, exerting lobbying power, and earning excessive profits which seems to be due to their opportunistic action as discussed in TCE. Even the investment made in mills is highly specific, not observed vertical integration and continuous business operation of Small and Medium Scale (SMS) millers as David and Han, (2004) stated that the higher levels of asset specificity are associated with more hierarchical governance. Wickramasinghe *et al.*, (2016) also urged that large-scale millers adopt Vertical Integration, and Wijesooriya, *et al.*, (2021) stated that certain leading millers engage in seed paddy production, trading of fertilizer, and manufacturing of packing materials proving the degree of vertical integration. However, the majority of the SMS millers' experience in business uncertainty seems to be due to the lower degree of vertical integration, and technological, and financial limitations.

The Scholars Wickremasinghe *et al.*, (2016); and Bandara *et al.*, (2022) argued that the impact of government intervention in regulating the market forces is ineffective and inefficient and may result in the opportunistic action

of the key players in the industry. As almost all the issues in the industry are related to opportunism, bounded rationality, uncertainty, and asset septicity which are the main concepts in TCE, it is imperative to study the application of transaction cost economics in the rice industry which has not yet been studied.

Under these circumstances, descriptive and epistemological research that predicts, describes, and empowers industry-specific knowledge was conducted to examine the applicability of TCE to identify the root causes of the issues and to identify challenges faced by millers in the industry.

II. THEORETICAL CONSTRUCT

Transaction Cost Economics (TCE), became a dominant theory in organizational management. TCE, broadly referred to as Transaction Cost Economics Theory is considered as one of the core building blocks in modern business research (Hennert & Verbeke, 2022). Theory suggests that conducting transactions is a costly endeavor and different modes of organizing transactions within a market or a firm entail different costs (Coase, 1937). The decision on whether a transaction is organized within the firm or carried out through the market depends on comparing these transaction costs (Coase, 1992). After four decades of initiation of the theory, Williamson (1981), refined the foundation laid by Coase and provided the necessary framework for empirically assessing, and validating the transaction cost theory. Williamson's, approach is heavily devoted to the belief that people lie, steal, and cheat and that opportunism is human nature. As shown in Figure 1, Williamson, (1981) refined the TCE theory by introducing two main assumptions; bounded rationality and opportunism, and three attributes; asset specificity, uncertainty, and frequency.

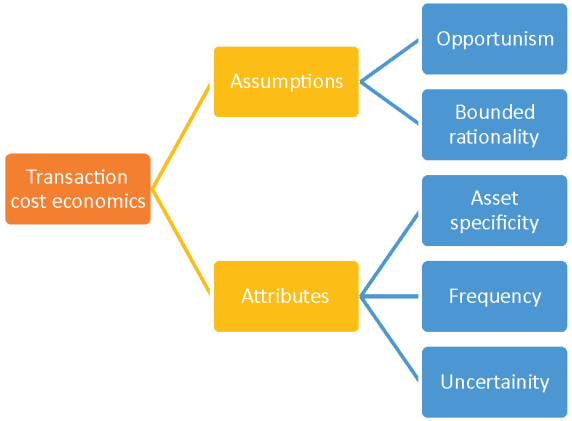

Figure 1: Assumptions and Attributes of TCE, (source: Author formulated)

1. Bounded Rationality

Economic actors make rational decisions based on available information and their mental capabilities to process information. The collection and processing of information incur costs. Different actors have different access to different sets of information. Williamson quoted the statement of Simon (1957) that the economic actors are "intendedly rational, but only limitedly so". Williamson (1981) stated that bounded rationality is assigning transactions to governance structures in a discriminating way, which means that economic actors have limitations in their analytical abilities and that the collection of information incurs costs. Bounded rationality concerns the cost incurred in the collection of information and the limitation of the analytical and data-processing abilities of economic actors due to mental capacity. Even with the available information, the experience in processing information for solving complex problems is limited (Williamson, 1981).

2. Opportunism

Williamson (1981) stated that opportunism is "self-interest seeking with guile", meaning that economic actors do not always share full information and objectively assess possible outcomes or behave cooperatively while executing transactions. He further elaborates that opportunism is an effort to realize individual gains through a lack of honesty in transactions. Furthermore, he stated that opportunism is a central concept and important for economic activity in transaction-specific human and physical capital investments. Perrow (1986) stated that the majority of people are prepared to lie, cheat, and steal most of the time. TCE assumes that few actors will behave opportunistically on a few occasions, it is extremely difficult to predict who will be opportunistic, and when. This minor possibility of opportunistic behavior can cause market exchange to break down. Therefore, economic actors must be concerned about the risk in transactions and the required to create safeguards mechanisms that allow the economic exchange to occur even under these risks.

Most organizations behave opportunistically by manipulating, misrepresenting, and withholding information. The information asymmetry, where each party holds different information on a particular situation, can generate two types of opportunism (Eisenhardt 2012): adverse selection and moral hazard. Adverse selection is pre-contract and it's a misrepresenting skill before being assigned the work. A moral hazard is post-contract and uses an information asymmetry advantage to the detriment of another party. The

failure to commit to the obligations is a main opportunistic behavior that should be concerned with transactions.

Verbeke and Greidanus (2009) have introduced a different version of opportunism in international business, known as bounded reliability which has an envelope concept with two components. The first one is strategic opportunism which is highlighted by Williamson, (1981) and the second is nonstrategic preference reversals. Non-strategic preference reversal is an ex-post reordering due to changes in priorities and over-commitment.

Opportunism is a common phenomenon and has a significant impact on firm performance as well as a critical factor in the buyer-supplier relationship. With a clear understanding of opportunism, firms can assess their position relative to their trading partners and identify areas likely to fall victim to opportunistic action.

3. Asset Specificity

Asset specificity refers to the greater value of an asset in its first use than its next best use or specialized investments made by one party, or both parties, to enable the exchange in a transaction. Asset specificity describes the condition where the identity of the parties for the continuation of the relationship. Asset specificity is the main determinant of governance choice in which the buyer induces the supplier to invest in specialized physical capital as well as human capital (Williamson, 1981). The majority of TCE research proved that higher levels of asset specificity are associated with more hierarchical governance (David and Han, 2004).

4. Uncertainty

Uncertainty refers to the inability to predict environmental changes and one another's behavior under unforeseen circumstances. The two exchange parties always have interests that might have to be overlapped. Once disagreements occurred in between parties it incurs costs. Williamson (1973) concerned the environmental uncertainty which is common, inescapable, and requires adaptation.

5. Frequency

The frequency refers to the volume of transactions that occur between the two exchange parties or the extent to of transactions recur. Williamson (1981) proposed that the overhead cost of more frequently recurring transactions in hierarchical governance is easy to recover. Therefore, the probability of

hierarchical governance is higher for more frequently recurring transactions than the less frequently recurring transactions.

III. MATERIALS AND METHODS

The government intervenes in the rice industry mainly to enhance the livelihood of farmers and ensure rice availability at affordable prices for the consumers as shown in Figure 2. Focus group discussions and interviews were conducted with subject specialists of the key respective government organizations and the main stakeholders in the industry. Data collection and the sample selection were done as shown in Table 1. Millers in the Ampara district were selected to conduct a questionnaire survey as it has a surplus production of 18 percent, the second-highest surplus production in the country (Wijesooriya, *et al.*, 2021). Furthermore, Wickremasinghe *et al.*, (2016) urged, the surplus production in the *Maha* season reached the market starting from Ampara, and the sharp price drop was observed when the government's intervention in purchasing was not prominent which will continue for other regions as well.

Table 1: Sample selection and data collection

	Selection of Sample	*Mode of data collection*	*Remarks*
01	Paddy Marketing Board (PMB)	Five focus group discussions were conducted with key officers	Stabilizing the market price of paddy and monitoring the Rice milling process
02	Consumer Affairs Authority (CAA)	Two interviews with subject specialists were conducted	Securing consumers by regulating the market price
03	Hector Kobbekaduwa Agrarian Research and Training Institute	Two interviews with subject specialists were conducted	conducting socio-economic research and providing market information.
04	Ampara district joint Farmer organization	An interview was conducted with the Chairman	Representing the producers' perspective
05	United Rice Producers Association (URPA)	Two interviews were conducted with the Chairman and an executive member	Representing the Small and Medium-scale millers' perspective
06	Essential Food Importers Association	An interview with the Chairman was conducted	Representing the Rice Importers and Wholesalers perspective
07	Large Scale Mill owner	An Interview with a large-scale mill owner was conducted	Representing large-scale millers' perspective
08	Millers in Ampara	Questionnaire Survey was conducted from randomly selected 25 millers registered in Ampara	Representing the SMS millers' perspective

(*Source:* Author Formulated, 2024)

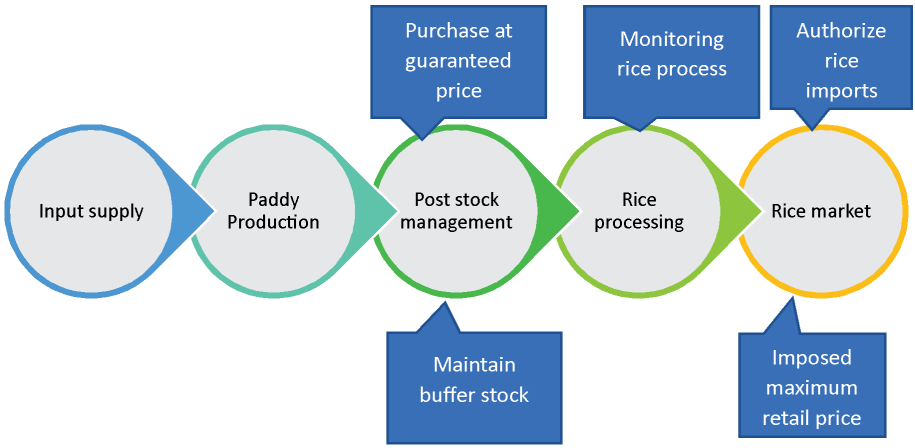

Figure 2: Government intervention in marketing forces of supply and demand of rice (Source: Author formulated, 2024)

IV. RESULTS AND DISCUSSION

The Sri Lankan rice industry experiencing a critical issue of high price fluctuation due to various reasons. The study identified issues faced by farmers during the selling of paddy due to farmer-specific and location-specific transaction costs, implications in the government purchasing mechanism followed the variation of the market price of paddy in reference to the Guaranteed price. In the case of SMS millers, issues of inability to meet working capital, transaction cost incurred by SMS millers during purchasing, a lower degree of vertical integration, technological limitations, performance implications, and consequences of market participation were identified. In addition, issues of decision-making for the import of rice, and the ineffectiveness of imposed MRP were identified. Finally, the study identified the challenges in the industry.

1. Farmer-specific and location-specific transaction cost

Farmers incur transaction costs in both the input and output markets. The input side costs can vary, with the choice of financings such as; money lenders, and commission traders as opposed to the formal banking system, method of input supply, and methods of cultivation. The Chairman of the Ampara District United Farmers Organization (ADUFO) stated that

> *"……. The majority of farmers sell their harvest just after harvest to settle credit obtained for the input for the cultivation as well as for the day-to-day expenses. This credit is given based on personnel trust with a virtual agreement of settling*

after harvesting of paddy or some time keeping a certain type of guarantee such as an informal lease agreement of valuable items etc. At the farm level, a number of private participants are involved in purchasing paddy as collectors on behalf of large-scale millers, brokers, and rice millers. The price determination is done by the paddy collector and farmers have no bargaining power. Certain farmers sell their harvest in the fields without drying or cleaning due to the inability to find expenses for drying and cleaning, lack of facilities for drying and cleaning, and ensuring immediate cash requirements to settle the credit obtained. In addition, lack of storage and climatic conditions also motivated farmers to sell paddy in the field itself. Under these circumstances, the farmers are compelled to sell their paddy at a price offered by the buyer. Further, farmers are cheated by collectors by use of fraud measurement and unethical weight reduction in relation to moisture conditions……" (Personnel Communication, 20 September 2023*).*

Farmers obtained credit with the traditional agreement is mainly based on trust and has no legality. Hence it can be violated by any of the parties due to opportunistic action which leads to higher transaction costs. These results were further elaborated by past scholars. For instance, Wijesooriya *et al.*, (2020) and Prasanna (2018), highlighted that village-level collectors provide inputs to the farmers on a credit basis and farmers lose their bargaining power and are compelled to sell their paddy to these village-level collectors at lower prices.

On the output side, the sale of paddy to brokers or collectors is done due to the inability to search for markets based on the information availability and the limitations in information processing capacity as discussed under the bounded rationality in TCE (Williamson, 1981). Therefore, farmers may get lower prices for their paddy (Wickremasinghe, 2016; Prasanna, 2019; Wijesooriya *et al.*, 2020). Authors further suggested that the income of paddy farmers deteriorated over time due to an increase in the cost of production, and the low market price.

The farmers' access to the knowledge of market demand and the cost incurred for farmers in a particular location or road access to the market may vary. Holloway *et al.*, (2000) also urged that tangible transaction costs such as transportation costs, communication costs, and legal costs incurred for producers.

The Chairman of ADUFO further said that

"…… If the farmer expects to sell their paddy at a higher price than local collectors, they need to identify the buyer who purchased the paddy at a higher price and need to arrange transport which incur additional cost. However, the majority of farmers cannot wait until the price goes up due to credit binding. The purchasing mechanism

> *of PMB is not effective and the guaranteed price offered by PMB is currently Rs. 93.00. and 95.00 which is much less than the cost of Production of Rs. 117.00 per Kg. If PMB increases the GP, the MP of paddy will be automatically increased accordingly.....”* (Personnel communication, 20 September 2023).

Hence the study identified that farmers incur costs for transport and communication while selling their harvest at higher prices as most of the paddy buying centers either PMB or private are far away from the producing areas, instead of selling to village-level collectors or the Lorries from large-scale millers come to the doorstep at lower price. This embellishes past literature. Wickremasinghe *et al.*, (2016) highlighted that transportation cost is a critical factor for selling surplus production either to the miller or to the village-level collector, or to the largescale miller which sends Lorries to the farm gate.

The harvested paddy is to be dried to a 14 percent moisture level and cleaned before storing (Rice Knowledge Bank, 2023) to minimize losses and process quality rice. If the farmer sells their paddy just after harvest, the collector or the miller who purchases the paddy needs to incur costs for drying, cleaning, and transport which leads to getting a lower price for the farmer to compensate for transaction costs. Hence, the credit-binding nature, and aggregation of these transaction costs determine market participation which is farmer-specific and location-specific. The lower transaction cost will give a higher price for the farmer and the higher transaction cost will give a lower price to the farmer. Accordingly, the market price (MP) of paddy can be lower in certain geographical areas due to the variation in transaction costs as suggested by past scholars (Pingali *et al.*, 2005, p. 6,7). Authors urged that agricultural producers incur farmer-specific and location-specific transaction costs.

Therefore, the study identified that the main reason for not getting a fair price to the producer is distress sales; the sale of paddy just after harvesting for an immediate cash need, especially in *Maha* season. As the majority of the farmers do distress sales, the surplus in the market is created causing lower demand followed by lower prices for paddy. This is in line with past literature. Wickremasinghe *et al.*, (2016, p. 2), stated that distress sales are common in most of the districts in the *Maha* season and price-responsive sales were prominent *Yala* season.

2. Implications in Government Purchasing Mechanism

The PMB is purchasing paddy directly from farmers at a floor price (Guaranteed price/GP) to increase the livelihood of the farmer and stabilize the market price.

Even though Wickremasinghe *et al.*, (2016, p.3) commended that the surplus production in the *Maha* season reached the market starting from Ampara, and the sharp price drop was observed in the absence of the government's mechanism, the study identified based on the focus group discussions that PMB has been started to purchase paddy during the latter part of the harvest in Ampara almost every year.

Based on the focus group discussions, the study revealed that PMB has an exclusive right to purchase, sell, supply, or transport or conduct a business of hulling milling, or processing of paddy and rice according to section 04 of the PMB Act no14 of 1971 (Paddy Marketing Board, 1971). After the re-establishing of PMB in 2008, an order has not been made through a gazette notification to legalize their exclusive right and allow the purchasing of paddy only to authorized purchasers at a guaranteed price. Therefore, any interested person or organization can perform the purchase of paddy at any price. Scholars (Wijesooriya *et al.*, 2020; Thibbatuwawa, 2021) urged that higher MP of paddy is observed during the off-season and lower MP during peak harvesting month. However, Bandara et al;(2023) proved in their study that there was no significantly lower market price of paddy in reference to the guaranteed price (GP) from 2015 to 2022 in main paddy-producing districts. However, certain geographical areas can have a lower market price in reference to GP due to the opportunistic actions of buying agents in addition to the farmer-specific and location-specific transaction costs as previously discussed (Pingali *et al.*, 2005). As the Chairman of ADUFO proposed, the study suggested that the determination of the floor price (guaranteed price) has to be in accordance with the cost of production enabling farmers to sell their paddy at a higher price.

3. Inability to meet working capital requirement

The millers need to incur a high amount of working capital to purchase paddy during the harvesting season due to the availability of paddy at an affordable price. Millers use different kinds of funding sources to make sure their funding requirements and certain millers face limitations also. The interview with a Chairman of the United Rice Processors Association (URPA) revealed that

> *"……. A mill having an average milling capacity of 10MT per day and working for 20 days a month needs 200MT of paddy worth Rs. 20 million for a month and for a season Rs. 120 million. Due to this high amount of fund requirement, SMS millers were unable to store paddy to meet the processing requirement. The millers*

> *can get different kinds of loans to fulfill the cash requirement to purchase paddy such as property loans, pledge loans as well as gold loans by means of pawning. The banks issued loans based on the guarantee provided by the millers irrespective of evaluating their capability on business performance. Currently, most of the millers are not in a position to get loans from the banks as they were blacklisted due to the failure to repay previous loans or the violations of the rules stipulated while they get the loan. The high and changing of the interest rate are the challenges for continuing millers' business.…*" (Personal Communication, 01 January 2023).

As stated by the Chairman of URPA, the study identified during the questionnaire survey that out of the millers in Ampara, 84 percent (21 millers) were unable to purchase the monthly processing requirement of paddy with their existing funding capacity. Only two millers can purchase a three-month requirement and out of that, only one miller is capable of purchasing 6 months requirement. Hence during the off-season, millers need to purchase paddy from the brokers and collectors or stock-holding millers with additional cost within the district or sometimes from outside the district which increases the transaction cost and leads to higher processing costs. The scholar Wijesooriya *et al.*, (2013) also confirmed that millers purchased paddy from outside districts also.

Even the Chairman of URPA said that most of the millers were blacklisted, none of the millers selected for the questionnaire survey had been blacklisted. Based on the questionnaire survey as a statement of URPA, the study identified that almost all the millers in Ampara urged that change of interest rate is a main issue for them and they proposed to have a lower and fixed interest rate for the loans they get to operate their mills.

4. Transaction costs incurred by SMS millers while purchasing paddy

The results of the questionnaire survey revealed that 84 percent of the millers purchased paddy from nearby farmers and the rest of the millers purchased paddy from outside areas as well. Therefore, the majority of millers in Ampara have the advantage of reducing transport costs which are categorized under tangible costs in TCE by Holloway *et al.*, (2000). Further, based on the results of the questionnaire survey, the study identified that 48 percent of the millers purchase paddy either through brokers or collectors which incur additional costs leading to high transaction costs.

Most of the farmers sell paddy in the field itself without drying and cleaning such paddy to be dried and cleaned before storing or processing. The

cost incurred to dry and clean will be added as an additional transaction cost for the miller instead of the farmer. However, with the availability of facilities, millers can do cleaning and drying of paddy at lesser costs than the farmer. Since the harvesting occurs within a short period such as two to three months, most of the millers are unable to dry and cleaning of the wet paddy received at the mill. The study identified that only one miller in Ampara has a mechanical drying facility and all others use sun drying which depends on the weather and is labor intensive. In addition, the study identified that 52 percent of the millers in Ampara have only a drying capacity to fulfill daily milling capacity which proved limitations in wet paddy purchase during the harvesting period which leads to lower demand for wet paddy followed by lower market prices as complained by producers.

Under these circumstances, the study identified that SMS millers were unable to purchase the required quantity of paddy during the harvesting time and maintain sufficient stock due to financial and technical limitations. Since most of the stocks were held by large-scale millers and collectors during the off-season, SMS millers who needed to continue their business were compelled to purchase paddy at a higher price which led to higher transaction costs causing an inability to sustain in the industry.

5. The Lower Degree of Vertical Integration of SMS Mills

The investment made in rice mills is highly specific; physical specificity and location specificity are prominent as discussed in TCE by Williamson (1981). During the interview with the representative of the large-scale miller stated that

> *"…. they adopted a higher level of vertical integration beyond the main role of paddy processing from farm gate to the consumer in the role as buyers of paddy, stock collector of paddy, processors, paddy supplier during the off-season, and wholesaler of rice. In addition, several millers engage in input supply. The credit affordability, storage facilities, sending lorries to the doorstep of farmers, and the use of modern technology create the miller's ability to buy large quantities of paddy at once, and to maintain large paddy storage to continue supply rice to the market throughout the year….."* (Personal Communication, 12 June 2023).

Hence, the study identified that the scale of the operation with an increasing return to scale can increase the productive efficiency of the milling operation. Based on the questionnaire survey the study identified that none of the millers in Ampara adopted vertical integration in comparison to the large-scale millers.

In the case of storage facilities, 48 percent of the millers in Ampara have a lesser storage capacity to fulfill the one-month processing requirement, which needs to be continuously purchased frequently even during the off-season which has higher market prices to continue their business. Out of the selected SMS millers, 84 percent of millers supply more than 50 percent of the processed rice to the market through wholesalers who collect rice at the mill in which transaction costs are to be borne by the wholesaler proving the lower level of vertical integration. In contrast, large-scale millers unload processed rice to the doorstep of the wholesaler bearing lower transaction costs with their available infrastructure facilities and the scale of operation. David & Han, (2004) stated that most TCE research proved that higher levels of asset specificity are associated with more hierarchical governance which SMS millers not adopt may be the main reason for business failure and uncertainty.

6. Performance implications of SMS millers

Millers are the most critical players in the rice value chain as they act in purchasing, storing, processing, and supplying rice to the market. The Chairman of the URPA further stated in the interview that

> *"…. The fund availability, loan interest rate, storage capacity, paddy production, and the market price of paddy are the factors that affect their paddy purchase. In addition, rice availability in the market due to seasonality, import of rice, and the market price of the rice are crucial factors in their performance. Further, the majority of the SMS millers experienced business failure, limited their production, or ceased by the banks due to the inability to repay the loans. During the off-season, paddy prices are much higher as few millers hold the stock. Therefore, the majority of millers stop their production during off season as if purchased paddy at a higher price they were unable to earn profit. The sale of rice occurs with a guarantee of dated cheque with the trust of settling one-month period which is high risk …."* (Personal Communication, 01 January 2023).

Based on the questionnaire survey, the study identified that none of the millers has come to formal contracts that have explicit procedures on the duties and responsibilities of both transaction parties to reduce opportunism as proposed by Dahlstrom & Nygaard (1999). Instead, parties tend to rely on social and economic outcomes instead of written contracts even with the existence of opportunistic behavior among exchange partners as stated by Wilson, (1995).

Based on a questionnaire survey, the study identified that 52 percent of the millers have restricted their processing to less than 15 days per month

during the off-season. Followed by the monthly processing quantity of rice becoming 48 percent in comparison to normal production in the sample millers. Therefore, the study suggested that the poor performance of SMS millers even having around 57 percent of the market share (Ministry of Health, Nutrition and Indigenous Medicine, 2017) is the main cause of the issues in the rice industry especially creating scarcity during the off-season leading to higher market prices of rice.

7. Technological limitations of SMS millers

Based on a questionnaire survey, the study identified that except for one mill owner and a technical operator, others do not gain any technological knowledge or business knowledge through formal education or training. They conduct their business operation and rice processing entirely based on personal experience and knowledge transfer from their family business which may cause them to experience business failure or unprofitable. Hence, most of the mill owners expect government assistance for technological improvement of the mills and training. As none of the mills had silky polishers and color sorter machines, they were unable to produce premium quality rice having a lush appearance without discolored grain to fulfill the market demand expected by the customer. The short-grain white (*Samba*) and long-grain white (*Nadu*) rice types available in the market undergo a parboiling process and around 50 percent population consumes parboiled rice types (Ministry of Health, Nutrition and Indigenous Medicine, 2017). However, except one miller all other selected mills in Ampara do not have the facility to process parboiled rice. Accordingly, the study identified that SMS millers in Ampara were technically incapable of competing with large-scale millers in the market while supplying quality rice required for the majority of the population.

8. Consequences in market participation of SMS millers

Based on a questionnaire survey, the study identified that except for 06 millers in Ampara, others do not supply rice to the supermarket chain, wholesalers, and retailers in the Colombo and Gampaha districts which are highly populated, highest production deficit and higher demand. Instead, most of the millers supplied rice to the Galle, Matara, Hambanthota, Badulla, Monaragala, and Rathnapura which were surplus or minor deficit in production as noted by Wijesooriya *et al.*, (2021). Therefore, the study identified that the inability of the millers to supply rice to the appropriate market which has a high demand

may be due to the bounded rationality issue, technical incapability, or supplying rice to a niche market.

9. Opportunism and bounded rationality issues in the decision-making on the import of rice

Based on the focus group discussions, the study identified that according to the order made under sections 04 and 10 of the PMB Act (Paddy Marketing Board, 1971), the sale, supply, transport or distribution, hulling, milling, or processing of paddy and rice are allowed only for authorized purchasers who get a permit from the PMB (The Government Gazette, 2010). Accordingly, the millers should report their processing condition and stock availability every month. However, PMB has not made any formal procedure to implement this regulation effectively. Therefore, the study identified that due to the absence of information on stock availability, and the inability to process available information, rice importers are getting an opportunistic advantage for importing rice by misguiding the policymakers.

The study identified that assessing the stock incurs costs as stated in bounded rationality in TCE (Williamson, 1981). Further, the study revealed in the focus group discussions with staff of PMB that even after assessing the stocks, policymakers tend to import rice without considering the stock availability may be political influence or opportunistic action of key players. The representative of the Essential Food Importers Association (EFIA) also urged that

> *"…. based on the market price of rice and the direction made by the Government they import rice. In certain years government allows definite quantities to be imported or adjust tax to restrict or relax imports, or sometimes ban imports. Indian rice can be imported within two weeks' time if there are no restrictions from India. The rice import from India can have similar characteristics that familiar with local verities than rice import from other countries…" (*Personnel Communication, 23 August 2023*).*

During the period from 2015 to 2022, lower production than the average during both the *Maha and Yala* seasons was observed in 2017 and 2022, and the *Maha* season of 2018 as shown in Figure 03.

As shown in Figure 04, except for 2017 and 2022 all other years from 2015 to 2022, the rice availability from domestic production exceeds the annual consumption requirement. The lower production in 2017 was reported due to the prevailing adverse weather conditions in the country and the 2022

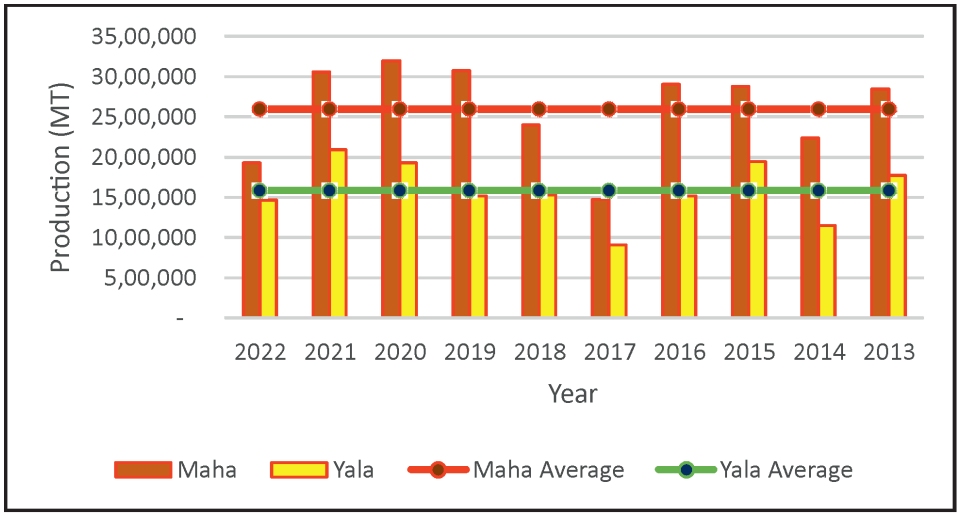

Figure 3: Seasonal paddy production during the last 10 years

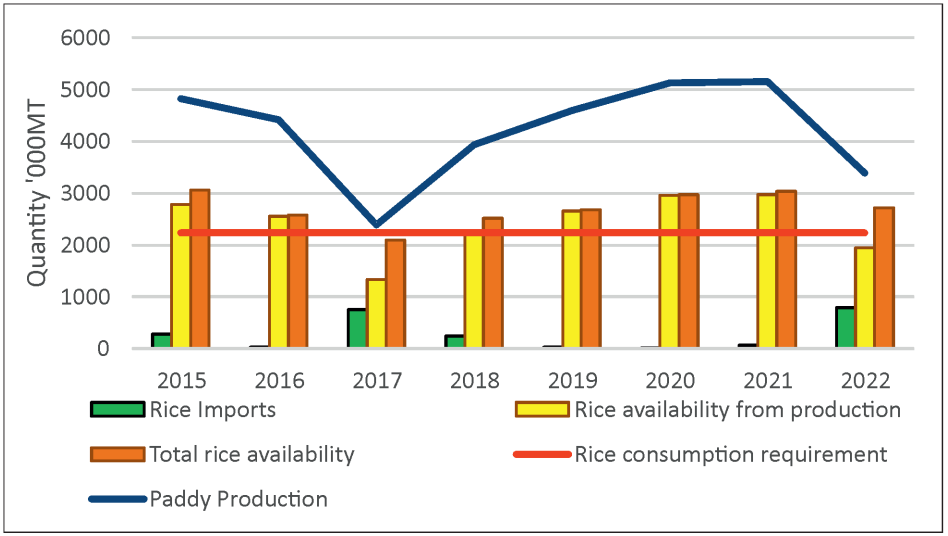

Figure 4: Supply and Demand of Rice from 2015 to 2022 (Source: Author compiled based on the information obtained from HARTI and Central Bank, 2023)

lower production was reported due to the ban on chemical fertilizer and the Agro chemicals (Annual Report of Central Bank, 2022).

However, even with the excess availability of rice from domestic production, an immense quantity of rice imports was observed in 2015, and 2018. Further, a greater quantity of total imports was made from January to

May which is the peak harvesting time in the country which leads to lower MP of paddy in the country in these two years as shown in Figure 05. Therefore, the study identified that the rice importation takes place without considering or proper assessment of the rice availability in the country.

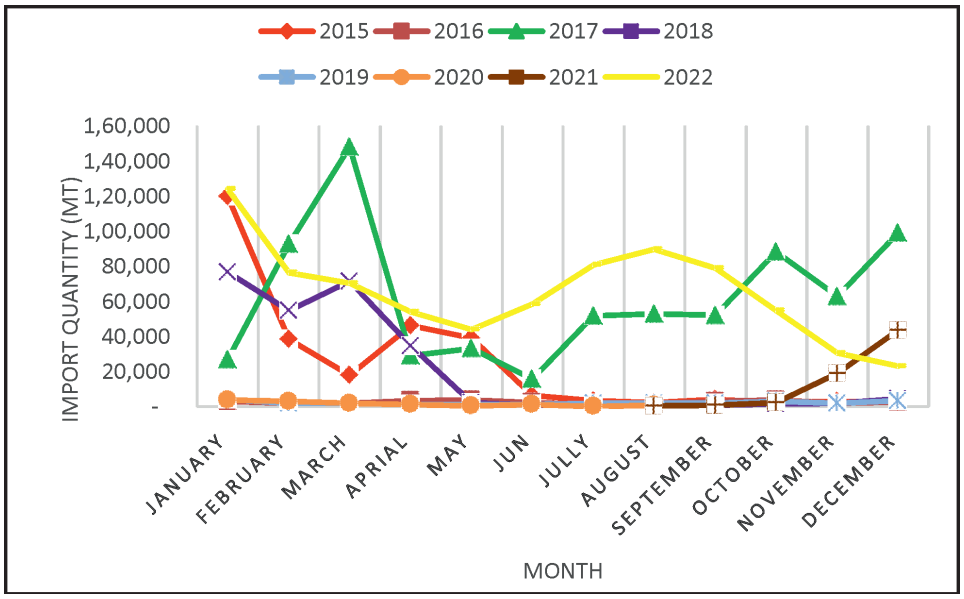

Figure 5: Import Quantities of Rice (Source: Author compiled based on the information obtained from HARTI, 2023)

10. Regulate the market price of rice through imposed maximum retail price

The variation of market price in reference to the maximum retail price (MRP) for major rice types of Short Grain White (*Samba*), Long Grain White (*Sudu Nadu*), White Raw (*Sudu kekulu*), and Red Raw (*Rathu ekkulu*) in Colombo district from 2015 to 2022 are shown in Figure 06, 07 and 08 respectively.

As shown in Figures 06, 07, and 08, for certain periods, the MRP was imposed only for selected rice types which may not be effective. In certain years, the MRP was not imposed during October to January of the following year which showed the highest market price in the rice market. This ad hoc imposed of MRP may be due to the unawareness of the market behavior or the opportunistic action of key players in the industry. In addition, MP of selected rice types showed higher than the MRP except in very few month proving

the ineffectiveness of implementation. The scholar Bandara *et al.*, (2022, p 1) also confirmed that the imposed MRP was not effective and not properly implemented to secure the consumer may be due to the opportunistic action of the key players in the industry.

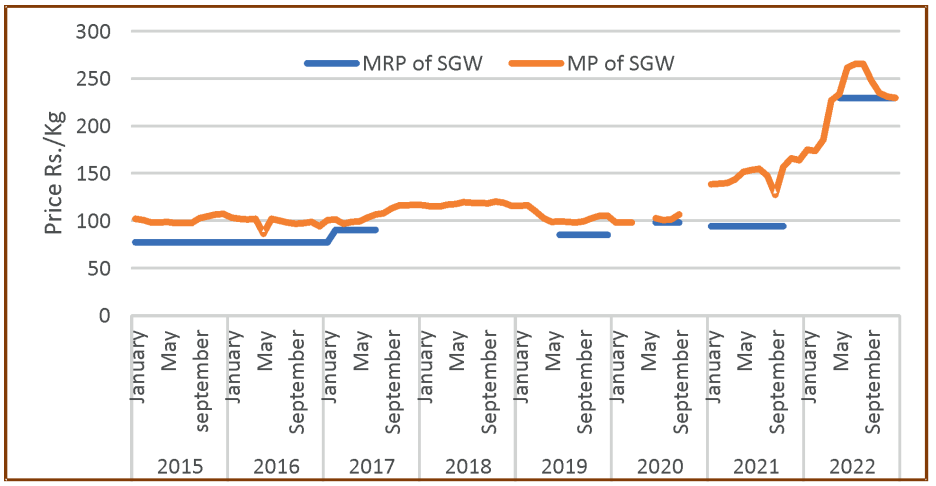

Figure 6: Variation of the Market price of Short Grain White Rice type with MRP

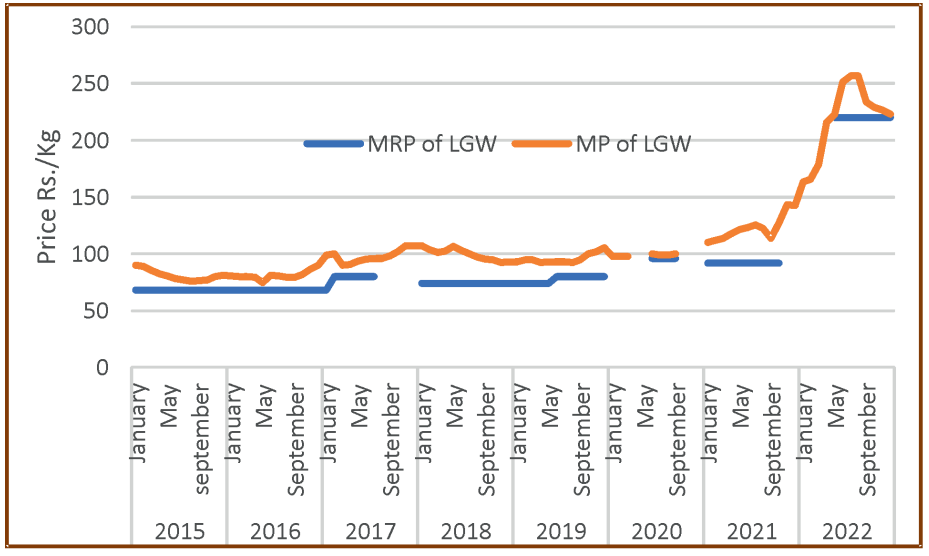

Figure 7: Variation of Market Price of Long Grain white Rice Type with MRP

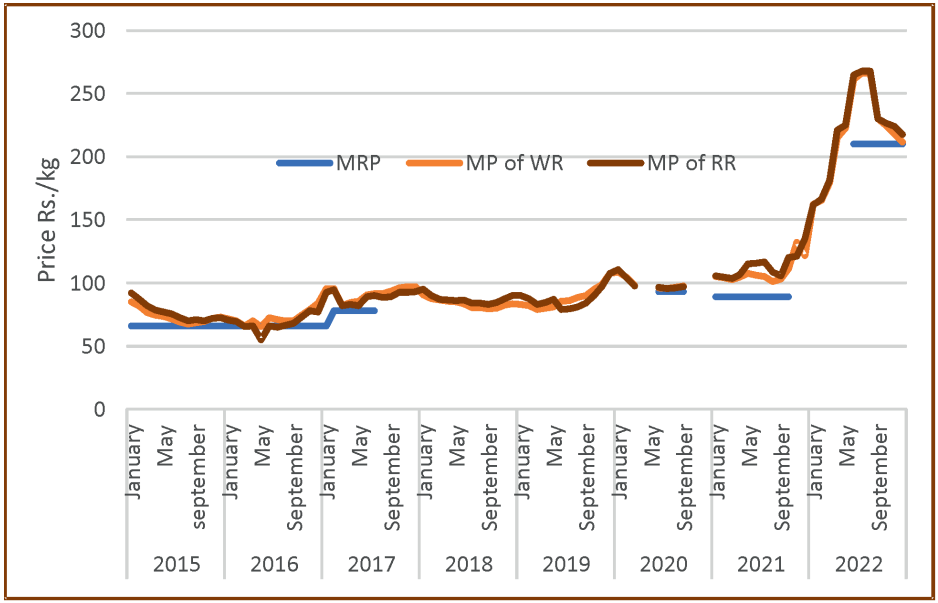

Figure 8: Variation of Market Price of White Raw and redraw Rice Type with MRP

The subject specialist of the Consumer Affairs Authority (CAA) stated during the interview that

> *"…..CAA published a gazette notification to impose a Maximum Retail Price (MRP). The MRP is imposed only for a rice type without considering the quality factors or the grades available in the market. Premium brands are available in the market as a handy and attractive package in which implementation of MRP is questionable……"* (Personnel Communication,04 March 2023).

Based on consumer demand, and processing technology the rice available in the market has different quality levels even in the same rice type. Based on the quality factors; broken percentage, uniform color, and discolored grains, mainly three grades; grade 1, grade 2, and grade 3 are available in the market at different prices.

11. The challenges identified in the rice industry

Initiatives to minimize transaction costs, legalize the exclusive power of PMB, minimize the impact on price due to surplus of paddy and deficit of rice in the market through post-stock management, effective implementation of MRP, and allow imports only for deficit are identified as major challenges in the industry as explained below. The PMB initiatives to arrange payment for transport costs

to the farmer, issue bags to pack the paddy free of charge, and facilitate drying and cleaning of wet paddy owing to farmers to meet the quality requirement through private millers at concessionary costs need wider applicability. This will assist in minimizing transaction costs incurred by farmers. Further, through legalizing the exclusive powers of PMB, the regulatory mechanism can be established by restricting only the authorized purchasers to purchase paddy at a guaranteed price to minimize price drops in the market due to distressed sales. The GP should be fixed based on the cost of production. Meanwhile, PMB also needs to purchase sufficient stock during harvesting time to reduce the surplus in the market. The purchased stock by PMB can be released to the SMS millers during the off-season enabling them to increase rice supply during the off-season to reduce deficit in the market. The imports should be allowed only for the deficit quantity after assessing, local production, processing conditions, and the stock availability with the SMS millers. If the MRP is imposed, it should be to the most popular rice types with designated quality factors and need a sound implementing mechanism. The government should enhance technical and financial assistance to SMS millers to improve their market share. Further, the Government should pay much attention to eliminating the opportunistic action of key players as proposed above.

V. CONCLUSIONS

The major debate in the rice industry is the higher price fluctuation creating an unfair price for the producer during harvesting and unaffordable price of rice for the consumer during the off-season. Farmers do distress sales during the harvesting period creating a surplus in the market and SMS millers' performance was minimal during off season creating a competitive advantage for large-scale millers to influence the market. The effectiveness of the intervention of the government is also not satisfactory as urged by the stakeholders. As the root causes of the issues in the industry seem to be related to opportunism, bounded rationality, asset specificity, and uncertainty which are discussed in Transaction Cost Economics, the study explores the opportunism, asset specificity, and uncertainty-related issues and challenges faced by the SMS millers in Sri Lanka. Therefore, descriptive research with an epistemological perspective was conducted through focus group discussions, interviews, and questionnaire surveys for the stakeholder groups of the industry.

Accordingly, the study identified that the majority of producers do distress sales during the harvesting period without adopting appropriate post-harvest

operations while creating a surplus in the market. The distress sale is to settle the loans obtained for the input supply and the immediate cash requirement as well as the absence of facilities for post-harvest operations. Even though certain studies identified that the market price of paddy in major paddy-producing districts was not significantly lower than the guaranteed price, certain areas can have lower prices due to the farmer-specific and location-specific transaction costs. Other than purchasing paddy directly from farmers at a guaranteed price, the initiatives of PMB such as facilitating farmer's post-harvest operations through private mills at concessionary cost, bearing the transport cost by PMB, and providing empty bags to pack the paddy free of charge are effective and reduce the transaction cost incurred by the farmer enabling them to have a better price. However, the guaranteed price offered by PMB is to be in relation to the cost of production as requested by the farmers. The study proposed to legalize the exclusive powers of PMB to mandate purchasing only through authorized purchasers at the guaranteed price to minimize the opportunistic action of key players, to minimize the impact of bounded rationality issues faced by farmers, and SMS millers and to strengthen the existing purchasing mechanism.

The majority of the millers incur higher transaction costs while purchasing paddy either through collectors or stock-holding millers. The study identified that the market share of SMS millers in Ampara during off season becomes half in comparison to the supply during the season may be common to other areas. The lower market supply during the off-season was due to technological limitations, the inability to meet the working capital requirement, and the limitations in maintaining paddy stock throughout the year. Under this circumstance, the market undergoes a scarcity of rice causing higher market prices during the off-season. Therefore, the study proposed purchasing a significant quantity of paddy by the government during harvesting to minimize the impact of surplus in the market, releasing those stocks during off-season enabling SMS millers to enhance their market supply to minimize the impact of deficit, and minimize business uncertainty of SMS millers through the continuing process throughout the year. As urged in TEC, the government should have a mechanism to strengthen SMS millers towards a higher degree of vertical integration as the investments made by the SMS millers are highly specific. Even though the government imposed a maximum retail price for rice, the study identified the imposed MRP was not systematically implemented in the retail market and the price was not regulated either.

The study identified the requirement to restrict the import of rice only to replace market deficit through a sound analysis of rice supply from domestic production, processing conditions, and stock levels with millers to minimize the impact of bounded rationality issues as well as to minimize the impact of opportunistic behavior of key players.

As most of the root causes of the issues in the industry are related to the opportunistic action of key players, bounded rationality, and uncertainty, the study proposed applying the strategies proposed to reduce the impact of issues in the rice industry.

VI. RECOMMENDATIONS

The study recommends the appropriate attention of the policymakers in the country regarding making required legal enforcement, effective implementation of appropriate regulations, and strategical approaches of minimized opportunism. In addition, further study is recommended on strategies required to minimize opportunistic action of key players in the industry. Though the present study gives interesting findings, it has several limitations that challenge generalizability as the study assessed only the performances of SMS millers in Ampara. Therefore, suggested assessing the performance of mills in other producing areas. This supports in making precise decisions and policy implementations related to the Sri Lankan context.

VII. CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

VIII. ACKNOWLEDGMENT

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