

ECONOMIC VIABILITY OF PADDY CULTIVATION IN LEADING PADDY-PRODUCING REGIONS OF SRI LANKA

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Abstract

Paddy farming plays a vital role in Sri Lanka's agricultural sector by supporting national food security and rural livelihoods. However, rising input costs, declining yields, and price instability threaten its economic sustainability. This study examined the economic viability of paddy cultivation in the major paddy-growing districts of Anuradhapura, Polonnaruwa, Kurunegala, Hambantota, and Ampara. Primary data were collected through a questionnaire survey, while secondary data were obtained from official reports and publications. A cost-benefit analysis was used to estimate net returns by considering input costs, yields, and paddy prices. The results revealed that the average cost of cultivating one acre ranged between Rs. 65,000 and Rs. 85,000, with fertiliser and labour accounting for the largest share of the cost. Significant yield variations were observed due to climatic factors and pest attacks. Profit margins were generally low, averaging Rs. 10,000–15,000 per acre, with negative returns in some areas. Overall, the findings indicate considerable economic pressure on paddy farming. The study emphasises the need for mechanisation, improved irrigation, and high-yielding seed varieties.

JEL: E31, Q11, D12, Q12

Keywords: Consumer Price Index, Cost of Cultivation, Household Expenditure, Net Income



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INTRODUCTION

Around half of the world's population consumes rice (FAO, 2024). Hence, the contribution of paddy farmers is crucial to the global agricultural economy. However, farmers faced many challenges in maintaining economic viability due to market dynamics, adverse climatic conditions, and ad hoc policy changes. The cost of cultivation and the net returns largely determine economic viability. In particular, labour and land costs significantly affected cultivation costs (Singh *et al.* 2024). Moreover, organic paddy farming has been found economically viable because of higher market prices (Namdev *et al.* 2013). The adoption of integrated nutrient management improves the yields and energy efficiency, leading to higher net returns in comparison to the conventional cultivation practices (Kharlukhi *et al.* 2024). The economic viability of paddy farmers in Sri Lanka is challenged by high costs of cultivation, market vulnerability, and environmental risks. Increase in input costs reduces net income, especially for fertilisers and fuel (Annual Economic Review, 2023). Wijesooriya *et al.* (2021) and Thibbatuwawa (2021) highlighted market price instability. The Price volatility affects millers, consumers, and weakens the competitiveness (Relief Web, 2024). In addition, unpredictable weather patterns, such as floods, droughts, and pest outbreaks, reduce yields. Therefore, adopting climate-resilient initiatives is essential but remains challenging. Under these conditions, initiatives to increase productivity and strengthen farming systems are vital. Enhancing resource use efficiency in water and fertiliser, diversifying crops, and optimising the supply chain with financial and technical assistance could improve viability (United Nations in Sri Lanka, 2024).

Wickramsingha *et al.* (2016) and Prasanna *et al.* (2012) noted that net income is often insufficient and sometimes falls below the costs of cultivation. This lack in bargaining power keeps farmers vulnerable to poverty. The poverty rate in Sri Lanka rose sharply from 13.1 per cent in 2021 to 25 per cent in 2022 (World Bank, 2024). The guaranteed price scheme of the government is important to be aligned with the UN Millennium Development Goal in the reduction of poverty and hunger. The prices in markets are adjusted to the guaranteed price, which rests on the cost of production, as well as an addition of a profit margin (Bandara *et al.* 2023). Therefore, the appropriate evaluation of cultivation cost, as well as anticipated viability, is necessary to find out the assured price. Therefore, the economic viability of paddy farmers is a research topic that is worth doing, which is insufficiently studied in Sri Lanka. The gap found in this case is the scarcity of literature on the economic viability of local paddy farmers. This is a novel study since it uses inflation rates and the consumer price index (CPI) to assess economic viability. The hypotheses proposed based on Wickramsingha *et al.* (2016) and Prasanna *et al.* (2012) are as follows:

H1: The net income produced by growing paddy in major producing districts is more than the cost of paddy cultivation.

H2: The net income gained by a farmer in the major producing districts is not adequate to cater to the household spending over the season.

This paper, therefore, evaluates the economic viability of the paddy growers in the main surplus-producing districts: Ampara, Anuradhapura, Polonnaruwa, Kurunegala, and Hambantota.

Problem Statement

Paddy farming remains important in Sri Lanka's agriculture and food security, yet farmers face economic challenges. Although the production, yield, market prices, and guaranteed prices vary, limited knowledge has been made on how these aspects influence the net income of the farmers and their ability to meet household spending. Seasonal changes also contribute to increased income instability, and the increase in inputs and prices, along with the Consumer Price Index (CPI) increases, have a direct effect on the purchasing power of farmers. Without accurate assessment and forecasting, small-scale paddy farmers struggle to plan production, manage costs, and maintain household financial stability. This gap in knowledge undermines policy-making and targeted interventions for enhancing the economic viability of paddy cultivation. Therefore, a comprehensive study examining production trends, income dynamics, seasonal impacts, and household expenditure patterns is critical to support evidence-based strategies for improving farmer livelihoods and ensuring national food security.

Research Objectives

Based on the above research problems, the following research objectives are drawn

- i. To analyse the historical trends of paddy production and average yield in *Maha* and *Yala* seasons across major cultivation districts in Sri Lanka.
- ii. To assess the variation in the cost of production, market price, and guaranteed price of paddy over time and across regions.
- iii. To evaluate the impact of seasonal variation on net income from paddy cultivation for farmers cultivating 1 ha of land.
- iv. To investigate the relationship between the Consumer Price Index (CPI) and household expenditure of paddy-farming households.
- v. To forecast future household expenditure and net income coverage using time series and economic forecasting models.

MATERIAL AND METHODS

The recent studies show that paddy cultivation remains economically unviable in many regions. The yield improvements, cost-effective input use, efficient water and energy management, and favourable market/policy conditions affect the economic viability of cultivation. Environmental feedback, input price shocks, and structural constraints can also rapidly erode the viability of cultivation, as summarised in Table 1.

Table 1: Summary of the Literature

Key factor to enhance Economic Viability	Description
Effect of Yield and Agronomic Practices	Yield increases remain the most reliable route to higher gross margins. Agronomic practices increase yields and directly improve income (Johnson <i>et al.</i> 2024)
Effect of Input Cost, Fuel and Labour	Rising costs for fertiliser, fuel, and hired labour have significantly compressed net returns. The inefficient use of fertilisers and energy increases production costs and reduces net profitability (Neelagar <i>et al.</i> 2025)
Water Management, Irrigation and Energy Use	Irrigation practices affect both yield and input costs. Alternate wetting and drying and other water-saving technologies often raise water productivity and can raise farmer profit, which improves viability (Johnson <i>et al.</i> 2024).
Mechanisation and Labour Substitution	Mechanisation reduces labour costs where labour is scarce or expensive. Mechanisation improves profitability when machines are appropriately matched to farm size or available rental markets (Rajendran, M., & Ranganathan, T., 2025).
Long-term viability and environmental sustainability	Intensive cultivation erodes the natural resources that become economically unsustainable and raise production costs over time, and harm viability (Van Aalst <i>et al.</i> 2023)

Source: Authors formulated based on the Literature (2025)

This study was conducted using a combination of time-series forecasting and economic forecasting models. Future projections were made based on the observed patterns and trends of secondary data. The trends in cost of production, average yield, market price, consumer price index (CPI), and household expenditure were first analysed. Based on these trends, future forecasts were then generated.

Seasonal Variation in Cultivation

Paddy cultivation in Sri Lanka is primarily influenced by two monsoon seasons: *Maha* (major) and *Yala* (minor). The *Maha* season occurs from October to March, receiving rainfall from the Northeast monsoon, while the *Yala* season lasts from April to September and depends on the Southwest monsoon, which brings comparatively less rainfall. Regional variations in rainfall directly affect cropping patterns, thereby impacting productivity and the overall economic viability of paddy farming (Department of Census and Statistics, 2024b).

Household Expenditure and the Consumer Price Index (CPI)

Net income from paddy cultivation depends on the cost of production, yield, and market price. The cost of production is strongly affected by inflation, while farm management practices such as mechanisation also influence costs. Similarly, household expenditure varies with inflation and can be assessed through CPI. Therefore, CPI was utilised in this study to predict household expenditure trends.

Consumer Price Index (CPI)

The CPI represents proportional variations in consumer prices over time. It reflects the changes in the cost of goods and services consumed by households and indicates shifts in purchasing power and welfare. The index is measured relative to a reference period with a value of 100, with subsequent periods compared to this base (International Monetary Fund, 2024). In Sri Lanka, CPI has been calculated monthly, and differences across districts are reported.

Household Expenditure

Household expenditure refers to the total spending by households on goods and services within a specific time frame. This includes essential items such as food, housing, healthcare, and transportation, as well as discretionary expenses. Hence, household expenditure serves as a key indicator of living standards and consumption behaviour in relation to the country's economic status (Organisation for Economic Co-operation and Development, 2024).

Household surveys in Sri Lanka are typically conducted at every three-year interval to assess average monthly household expenditure for a standard four-member family (Department of Census and Statistics, 2019). The most recent available survey was conducted in 2019, with no updated evidence available afterwards. For this study, district-wise Average Household Expenditure per Month (AHEM) was used as the reference measure.

$$AHEM_i = A = \pi r^2 \frac{AHEM_n}{CPI_n} \times CPI_i \text{ ----- (01)}$$

Where $AHEM_i$ = Average household expenditure per month in i^{th} year

$AHEM_n$ = Average household expenditure per month in the n^{th} year

CPI_i = Average Consumer Price Index in the i^{th} year

CPI_b = Average Consumer Price Index in the n^{th} year

Based on the AHEM in 2019, the AHEM of 2021 was calculated using Equation 1 (The average CPI in 2019 was 129.59, and in 2021 was 147.21 according to the base value of 100 in 2013). Subsequently, based on AHEM in 2021, AHEM in respective years was projected using Equation 1.

The scatter plot of the CPI (Consumer Price Index) values over time (in months) shows a general upward trend, indicating that the index is increasing over time. This trend suggests a potential linear relationship between time and CPI, making linear regression an appropriate method for modelling. Therefore, based on the monthly CPI value from September 2022 to November 2024, linear regression was applied to project the CPI from December 2024 to December 2025.

The unit costs, average yield, and market prices (Price at which a farmer could sell his paddy) were obtained from the secondary data (Department of Agriculture, 2023; Food Commodity Bulletin, 2024). In addition, the guaranteed price declared by the Paddy Marketing Board was considered.

Due to the unavailability of secondary data, the AHEM was projected for 2022, 2023, 2024, and 2025 based on the three assumptions. First, the average yield from the 2023 *Yala* season onwards was assumed to be the mean average yield of the respective season. The second, the variation of unit cost was projected based on the current annual inflation rate of 01 per cent. Finally, the market price of paddy was assumed to be equal to the guaranteed price of Rs. 120.00 per Kg in 2025.

The following equations were used in the respective calculations

$$\text{Paddy Production} = \text{Average paddy yield (Kg/ac)} \times 2.5 \text{ ac} \text{ ----- (02)}$$

$$\text{Cost of Cultivation} = \text{Paddy Production (Kg)} \times \text{Unit cost (Rs./Kg)} \text{ ----- (03)}$$

$$\text{Household expenditure required for a season} = \text{AHEM} \times 6 \text{ ----- (04)}$$

$$\text{Gross Income} = \text{Market Price (Rs./Kg)} \times \text{Paddy Production} \text{ ----- (05)}$$

$$\text{Net income (Profit)} = \text{Gross Income} - \text{Cost of Cultivation} = (05) - (03) \text{ ---}$$

$$\text{----- (06)}$$

$$\text{Months can sustain} = \frac{\text{net income}}{\text{AHEM}} \text{ ----- (07)}$$

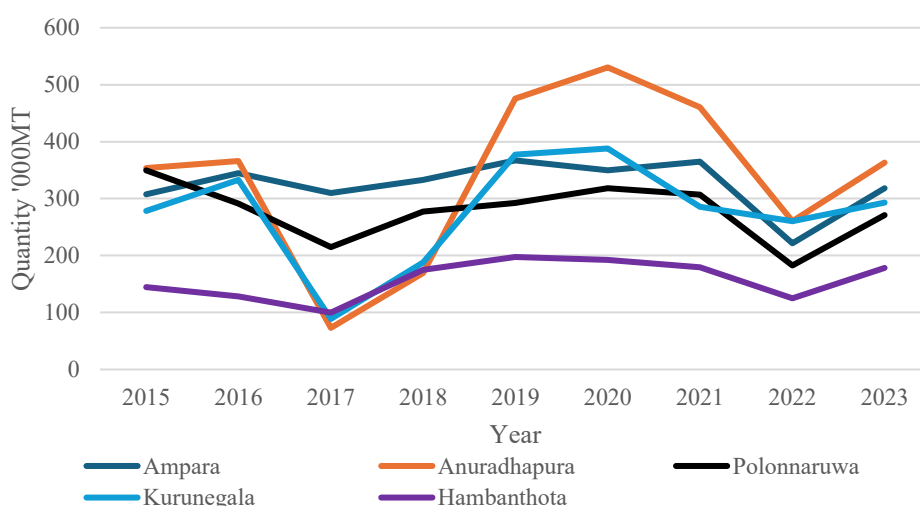
The study was conducted in five major surplus paddy-producing districts, namely, Ampara, Anuradhapura, Polonnaruwa, Hambantota, and Kurunegala.

RESULTS

Seasonal Variation of Paddy Production

Paddy farming serves as the primary livelihood for approximately 0.9 million farmers in Sri Lanka (Wijesooriya *et al.* 2021). However, farmers' net incomes are often limited by the fluctuation of prices in the market and the rise in the cost of cultivation. The results indicated that during both the *Maha* and the *Yala* seasons in major paddy-producing districts, prominent fluctuations might be due to climatic conditions and policy changes. For example, (Figure 1) seasonal variations of production in the *Maha* season were observed from 2015 to 2023.

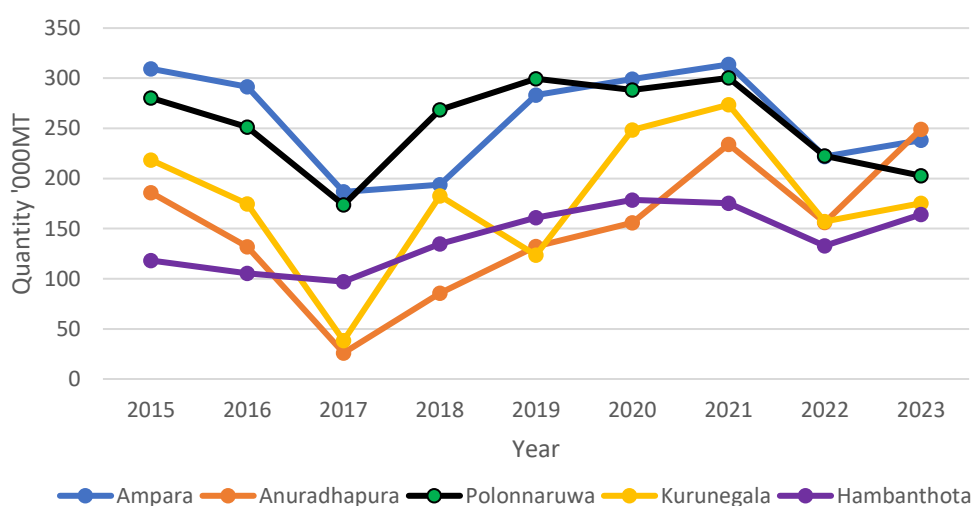
Figure 1: District-wise Seasonal Variation in Paddy Production During the *Maha* Season (2015 to 2023)



Source: Department of Agriculture (2023)

Seasonal variation of paddy production in the *Yala* season from 2015 to 2023 is also evident (Figure 2). Lower production in 2017 occurred due to adverse weather conditions, and in 2022, it was caused as a result of the policy decision to ban chemical fertilisers (Central Bank 2017, 2022).

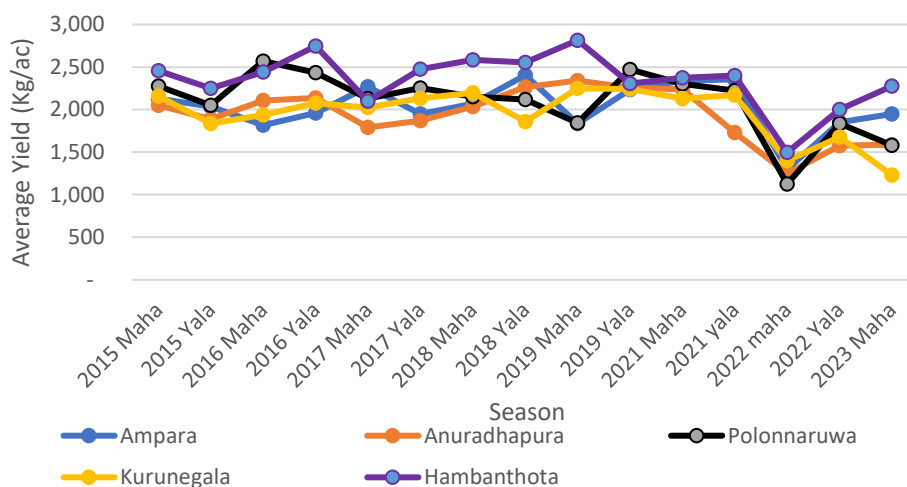
Figure 2: District-wise Seasonal Variation in Paddy Production During the *Yala* Season (2015 - 2023)



Source: Department of Agriculture (2023)

The drastic yield reduction, whether caused by adverse climatic conditions or policy changes, resulted in a significant decline in farmers' incomes, highlighting the vulnerability and the impact on economic viability. The variation in average yield was also observed in both the *Maha* and *Yala* seasons (Figure 3).

Figure 3: District-wise Trend of Average Paddy Yield in Maha and Yala Seasons (2015–2023)

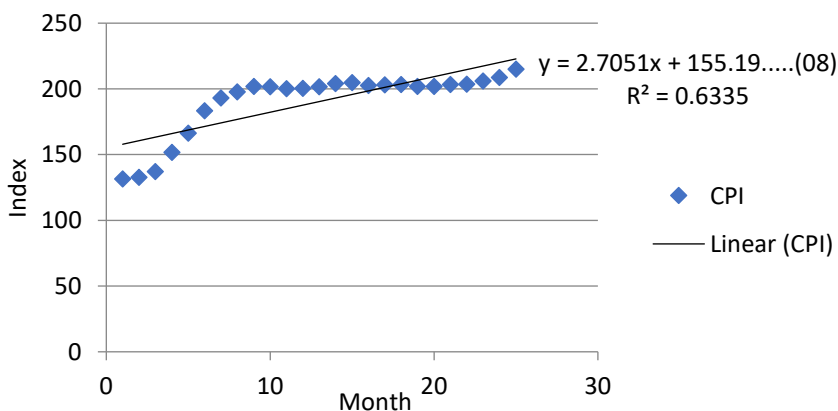


Source: Department of Agriculture (2023)

Household Expenditure and Consumer Price Index

The CPI data are available up to November 2024, and CPI in the rest of the months was projected based on the regression Equation 8.

Figure 4: Linear Regression Analysis of Consumer Price Index (Sep 2022 – Nov 2024)



Source: Department of Census and Statistics (2024)

$$y = 2.7051x + 155.19 \text{ ----- (08)}$$

The average household expenditure per month (AHM) was calculated for 2021, based on a base value of 100 in 2013. Thereafter, AHM was computed while considering the base value of 100 in 2021 (Table 02). The study further projected CPI and AHM for 2025, assuming an inflation rate of 1 per cent (Table 02). This analysis demonstrates that costs have been progressively increasing, indicating rising financial pressure on households in major paddy-producing districts since 2021; however, with economic growth and the seasonal variation of the price of commodities, household expenditure may vary.

Table 2: Projected Monthly Household Expenditure (Rs.) using (Equation 1)

District	AHEM (Rs.) 2019	AHEM (Rs.) 2021	AHEM (Rs.) 2022	AHEM (Rs.) 2023	AHEM (Rs.) 2024	AHEM (Rs.) 2025
Hambantota	54,169.00	61,534.21	107,598.72	125,400.57	128,914.17	133,098.50
Ampara	52,924.00	60,119.93	105,125.71	122,518.41	125,951.26	130,039.41
Kurunegala	57,769.00	65,623.69	114,749.59	133,734.53	137,481.64	141,944.05
Anuradhapura	52,796.00	59,974.53	104,871.46	122,222.09	125,646.64	129,724.91
Polonnaruwa	51,295.00	58,269.44	101,889.95	118,747.30	122,074.48	126,036.80
National Average	63,130.00	71,713.61	125,398.43	146,145.17	150,240.02	155,116.55

Source: Authors' calculation based on CPI data from the Department of Census and Statistics (2024)

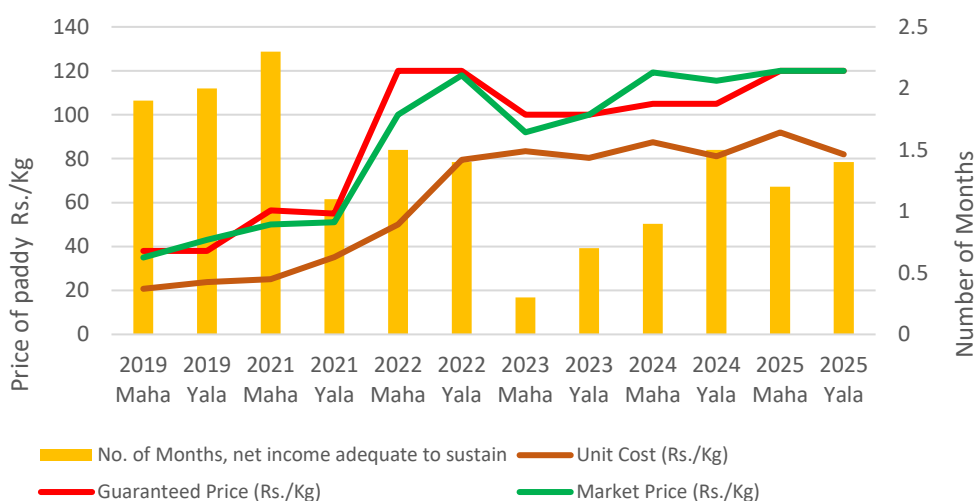
Economic Viability of Cultivation in Major Paddy-Producing Districts

Anuradhapura

The study results confirmed that paddy cultivation in Anuradhapura district was profitable since the Market Price (MP) of Major Paddy producing districts was significantly higher than the unit cost (Figure 5), supporting the hypothesis H₁. From the 2022 *Maha* season onwards, an increase in unit cost (cost of producing 1 kg of paddy) was observed, which might have resulted from a reduction in average yield. The study reveals that the number of months during which farmers could sustain a net income ranges from around one and a half to two months or more until the 2022 *Yala* season.

However, in the *Maha* seasons of 2024 and 2025, it was identified that the net income could cover around one month's household expenditure. In the *Yala* season of 2024 and 2025, the study indicated that the net income was adequate to sustain around one and a half months' household expenditure. Based on the results, the study suggested that the farmers received insufficient net income to sustain their household expenditure until the next season's harvest. Accordingly, the results confirmed that paddy cultivation in the Anuradhapura district is not economically viable under existing practices, supporting the hypothesis H₂.

Figure 5: Seasonal Variation of Costs, Prices, and Net Income Coverage for 1 ha Paddy Farmers in Anuradhapura

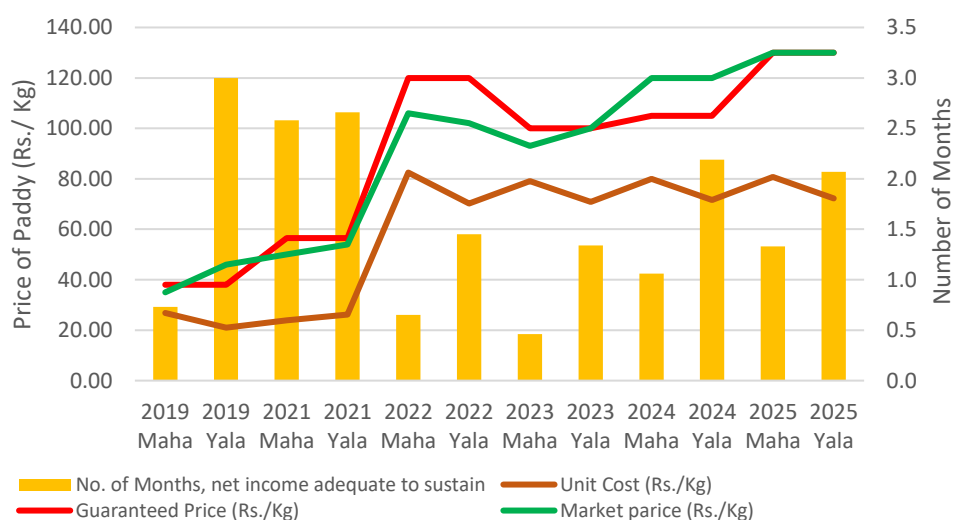


Source: Authors' calculation based on data from the Department of Agriculture (2023)

Polonnaruwa

The study results revealed that MP was greater than the unit cost, which confirms the profitability (Figure 6) of cultivation in Polonnaruwa, supporting the hypothesis H₁. The unit cost was increased from the 2022 *Maha* season onwards, which might have been due to the prevailing economic conditions in the country.

Figure 6: Seasonal Variation of Costs, Prices, and Net Income Coverage for 1 ha Paddy Farmers in Polonnaruwa



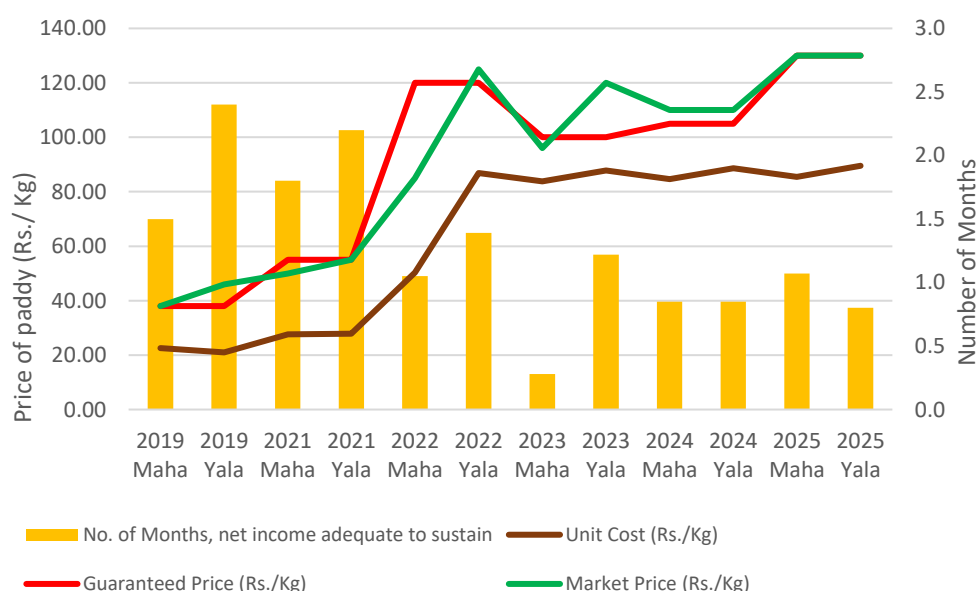
Source: Authors' calculation based on data from the Department of Agriculture (2023)

The results (Figure 6) demonstrate that the number of months that the net income could cover their household expenditure was around one month in both *Maha* seasons in 2024 and 2025. In the *Yala* season, the net income covered their household expenditure for around two months in both 2024 and 2025. Accordingly, the results confirmed that the paddy cultivation in Polonnaruwa is not economically viable, supporting the hypothesis H₂.

Kurunegala

The study identified that greater MP was greater than the unit cost, which confirms the profitability of paddy cultivation in Kurunegala, similar to Polonnaruwa and Anuradhapura, supporting the hypothesis H₁(Figure 07). The study indicated that the unit cost considerably increased from the 2022 *Maha* season onwards, possibly due to the economic crisis in the country, leading to lower net returns. The results revealed that in the 2023 *Maha* season, the net income was insufficient to sustain at least half a month's household expenditure, which may have resulted from limitations on fertiliser supply. However, from the 2023 *Yala* season onwards, the net income was sufficient to cover household expenditure for around one month.

Figure 7: Seasonal Variation of Costs, Prices, and Net Income Coverage for 1 ha Paddy Farmers in Kurunegala



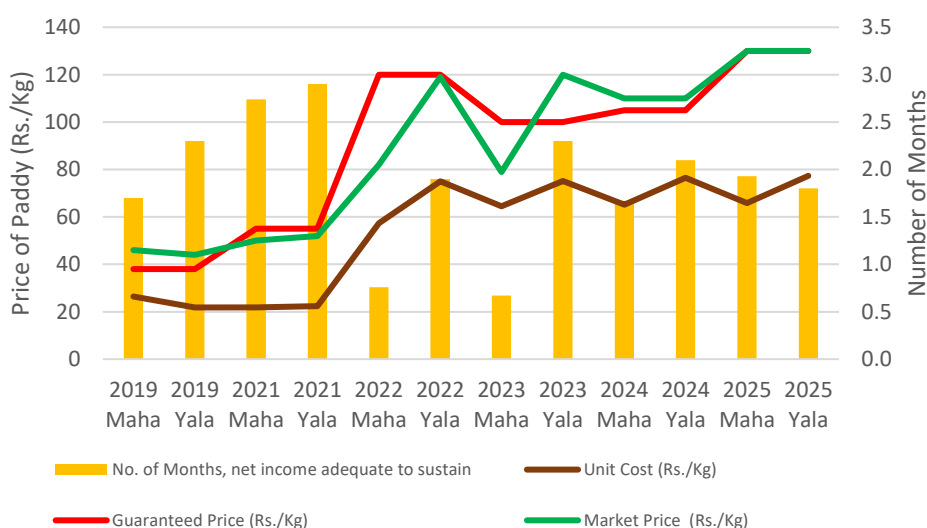
Source: Authors' calculation based on data from the Department of Agriculture (2023)

Accordingly, the results confirmed that the paddy cultivation in Kurunegala is not economically viable, supporting the hypothesis H₂. The study identified worse economic viability in Kurunegala compared to Polonnaruwa and Anuradhapura.

Ampara

Much higher MP than the unit cost confirms the profitability in Ampara, similar to Anuradhapura, Polonnaruwa, and Kurunegala, supporting hypothesis H₁ (Figure 8). The results indicated an increase in unit costs from the 2022 *Maha* season onwards. The results revealed that in the 2023 *Maha* season, the net income was insufficient to sustain at least half a month's household expenditure, possibly due to limitations on fertiliser supply. From the 2023 *Yala* season onwards, the net income was adequate to sustain around two months of their household expenditure (Figure 8).

Figure 8: Seasonal Variation of Costs, Prices, and Net Income Coverage for One Hectare Paddy Farmers in Ampara



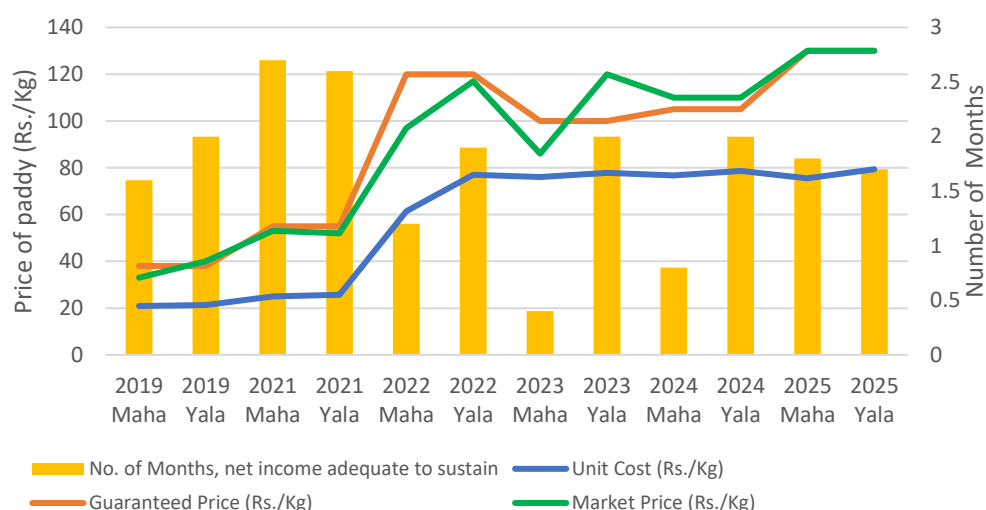
Source: Authors' calculation based on data from the Department of Agriculture (2023)

Accordingly, the study confirmed that the cultivation in Ampara is not economically viable, supporting the hypothesis H₂. This situation is more favourable compared to Anuradhapura and Kurunegala.

Hambantota

Same as other selected districts, the study identified that the MP was higher than the unit cost in Hambantota, which confirms the profitability in cultivation, supporting hypothesis H₁ (Figure 09). Same as for the Polonnaruwa, Ampara, Kurunegala, and Anuradhapura, the results indicated that the unit cost increased from the 2022 *Maha* season onwards.

Figure 9: Seasonal Variation of Costs, Prices, and Net Income Coverage Months for 1 ha Paddy Farmers in Hambantota.



Source: Authors' calculation based on data from the Department of Agriculture (2023)

The results revealed that in the 2023 *Maha* season, the net income was insufficient to sustain at least half a month's household expenditure, possibly due to fertiliser supply limitations. In 2024, the net income could be adequate to sustain around one month's household expenditure. The study projected that the net income will be adequate to sustain around 2 months of household expenditure, similar to Polonnaruwa and Ampara (Figure 09). Accordingly, the study results confirmed that the paddy cultivation in Hambantota is not economically viable, supporting the hypothesis H_2 . However, these results indicate better economic viability compared to Anuradhapura and Kurunegala.

DISCUSSION

Theoretical Implications

The study of the economic viability of paddy cultivation in Sri Lanka provides new insights into vulnerability to diverse climatic calamities, policy changes, and market forces. The fluctuations in production and price due to seasonal and adverse weather conditions and unstable policies highlight the importance of input-output relationships. Policies such as minimum support prices (MSPs) in India, Guaranteed Prices in Sri Lanka, and access to crop insurance are essential for economic stability for paddy farmers. The study conducted by Srinivasa *et al.* (2023) shows that farmers' awareness of policy matters does not necessarily improve bargaining. In addition, the Sri Lankan government implemented a policy decision to ban agrochemicals and chemical fertilisers, resulting in a decline of domestic yield by around 34 per cent, which harmed the net income of paddy farmers in 2022 (Central Bank of Sri Lanka, 2022).

Under these circumstances, the study emphasises the necessity of incorporating risk factors and economic policies into models that can predict productivity and enhance profitability. Further, the findings revealed discrepancies in economic viability across different regions, suggesting that uniform policy applications might not yield similar results. This study employed a formula (Equation 01) while projecting the household expenditure based on the consumer price index. Except in 2022, the variation of CPI appeared linear. Therefore, the study assumes a linear relationship. This initiative serves as an insightful guide for academics and researchers in predicting future economic endeavours.

Managerial Implications

Certain studies indicate that mechanisation and training of farmers significantly improve economic outcomes. For instance, in southern India, training provided on the adoption of modern farming practices, such as mechanisation and improvements in seed quality, led to an increase in farmers' income by 19.17%. That was due to the reduced labour costs and an increase in yields (Bharath & Sriram, 2024). Therefore, policymakers can initiate programs to reduce production costs through cost-effective mechanisation and suitable agronomic practices. Accordingly, farmers can be encouraged to reduce household expenditure through home gardening and mixed cropping systems.

As Amitha et al. (2023) stated, the socio-economic factors, including land ownership, education level, and the role of farmer organisations, affect economic success. Therefore, farmers with access to collective resources and higher education are more likely to adopt innovations and negotiate better market terms, thereby improving economic resilience.

Policymakers should consider subsidising the price and availability of key inputs such as fertiliser and seeds. This stability is particularly important during economic recessions to enhance farmer profitability. Further, to reduce disparities in economic viability among districts, region-specific interventions are recommended. For instance, providing additional support, such as an efficient price stabilisation mechanism through guaranteed paddy purchase and a crop insurance program, can assist farmers in economically less viable districts, such as Kurunegala, to mitigate uncertainty. Further, the training programs can assist farmers in adopting sustainable practices and efficient resource utilisation, thereby reducing production costs and improving yields.

The study relied on secondary data from irrigated paddy cultivation in major paddy-producing districts. Hence, further regional-specific studies are necessary to generalise the findings. Additionally, full-time farmers can utilise labour and farm machinery to reduce the cost of cultivation. The study projected an increasing trend in household expenditure based on the CPI. However, based on the economic growth and seasonal price variations, household expenditure might decrease if the current economic condition continues, which represents a limitation in this study.

Further, this study identified that district-level household expenditure may not apply to farmers who have a source of a significant portion of their food from home gardens. Most of the farmers in other districts cultivate fragmented plots of less than 1 hectare. The irrigation facilities are also below an acceptable standard, which could worsen the situation. Therefore, a comprehensive, region-specific study is proposed to generalise these results. In addition, the study of a sample survey examining actual income and household expenditure across different regions would enhance the understanding of economic viability.

CONCLUSION AND RECOMMENDATIONS

Since paddy cultivation is the main livelihood, most farmers often argue that net income from paddy cultivation is insufficient to sustain their household expenditure throughout the season. Hence, this study aimed to assess the economic viability of paddy cultivation using secondary data from five (5) major surplus paddy-producing districts (Anuradhapura, Polonnaruwa, Ampara, Kurunegala, and Hambantota) of Sri Lanka. The analysis revealed that paddy cultivation, having 1 ha of irrigated land in major paddy-producing districts, is profitable, supporting hypothesis H₁. However, the market is often below expectations, affecting farmers' net income, limiting their ability to cover household expenses, fully supporting hypothesis H₂.

Hence, economic viability is severely challenged due to continuous increases in input costs, fluctuations in the paddy prices caused by market uncertainties, yield reduction resulting from climatic variability, and policy impacts. The Anuradhapura, Polonnaruwa, Ampara, and Hambantota show relatively favourable economic viability as net income can sustain their household expenditure for around one month or more. However, Kurunegala experienced a more critical situation, projecting that farmers could sustain their household expenditure for less than a month. This regional disparity highlights the need for targeted and region-specific adaptive measures.

Policymakers should consider initiatives to mitigate risks and uncertainties, and promote resilience through economic support, technological assistance, and resource allocation. Further, farmers should be encouraged to reduce their cost of cultivation through training and adoption of appropriate technology, such as feasible mechanisation, cost-effective labour, and agronomic practices. In addition, farmers can reduce household expenditure by using home gardening to meet their food requirements. The study focused on the status of five surplus-producing districts using secondary data. As the cost of cultivation and market dynamics are location- and farmer-specific, a more comprehensive study is needed to generalise the findings.

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