Volume: 34, Issue: 1
Page: 13-25
2024

International Journal of Science and Business

Journal homepage: ijsab.com/ijsb

Comparative Profitability and Productivity Analysis of Rice Production in Coastal and Arable Land Areas of Bangladesh

Mahfuja Akter, Mabia Khatun, & Zahidul Islam

Abstract

This study aims to compare the productivity and profitability of rice production in coastal and arable land areas in Bangladesh while analyzing the factors influencing productivity and profitability. It seeks to provide insights into the differences in agricultural outcomes between these two types of land, essential for policy formulation and agricultural development. The research employs a stratified random sampling method to gather primary data from six villages in Gopalganj and Khulna districts, targeting 30 farmers from each village. Cobb-Douglas profit and production function analysis is utilized to estimate the impact of various factors such as seed cost, labor cost, fertilizer cost, insecticide cost, ploughing cost, and irrigation cost on profitability. The study reveals significant differences in productivity and profitability between coastal and arable land areas for rice cultivation. It identifies key factors affecting productivity and profitability, emphasizing the importance of policy support for enhancing the quality of inputs to bridge yield gaps and improve rice crop outcomes. One limitation of this research is the focus on specific regions within Bangladesh, potentially limiting the generalizability of findings to other areas. Additionally, the study may not capture all variables influencing productivity and profitability due to data constraints. The findings provide valuable insights for policymakers, suggesting the need for targeted interventions to support farmers in improving productivity and profitability. This research contributes to the existing literature by offering empirical evidence on the productivity and profitability dynamics of rice production in coastal and arable land areas in Bangladesh.

IJSB
Accepted 26 February 2024
Published 01 March 2024
DOI: 10.58970/IJSB.2332

ISSN: 2520-4750 (Online) 2521-3040 (Print)

Keywords: *Profitability, Productivity, Coastal, Arable land, Cobb-Douglas, Bangladesh.*

About Author (s)

Mahfuja Akter (corresponding author), Assistant Professor, Department of Economics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University (BSMRSTU), Gopalganj-8100, Bangladesh.

Mabia Khatun, Assistant Professor, Department of Finance and Banking, Bangabandhu Sheikh Mujibur Rahman Science and Technology University (BSMRSTU), Gopalganj-8100, Bangladesh.

Zahidul Islam, Senior Lecturer, Dept. of Business Administration, Uttara University, Bangladesh.

1.0 Introduction

Agriculture, the spirit of human civility, is the most important sector of Bangladesh, contributing 14.2% to the national GDP and providing employment for about 47% of the total population (Finance Division, Ministry of Finance, 2023). It is the most primal way of life all over the world, and still 60% of the world population directly or indirectly rely on farming for subsistence. Being admired for so many naturalistic possessions, Bangladesh has the credit of producing so many cereals and cash crops. Rice is the most prevalent and mentionable among them, occupying 73% of the total cropped area and being the staple food of more than 95% of people (Finance Division, Ministry of Finance, 2023). Not only that, almost half of the world's population's staple food is also rice. Bangladesh is the 6th largest rice producer country in the world. Though the production of rice in Bangladesh is increasing day by day, every year in the last decades, Bangladesh has had to import food grains to fulfill the extra demand because of decreasing land, natural calamities, a lack of technological use, etc. Bangladesh is close to self-sufficiency, and this can only be done if the productivity of paddy and profitability can be increased.

The expansion of the HYV saline-tolerant variety of seeds, improved management, efficient use of resources, and timely supply of inputs are all indicators of increased rice production (Joshi et al., 2004). Studies regarding the comparative profitability and productivity of rice production in coastal land areas are very few. Therefore, the present study has focused on assessing the profitability and productivity of rice production in a few coastal and arable areas in Bangladesh and is expected to provide valuable data for further analysis and the formulation of appropriate policies for improved rice cultivation in those areas.

Bangladesh is geographically a low-lying riverine country with a 580 km coastline in the northern littoral of the Bay of Bengal (Esa Abrar Khan, 2017). So, some of the areas have such salinity that the production of paddy is broadly hampered there. Moreover, as the profitability ratio of rice production is also very low for the farmers, they are losing their enthusiasm to produce this cereal. So, it’s crucial to uphold the overall scenario of productivity and profitability conditions for rice in both coastal and arable land areas and perform a comparative analysis of why that scenario occurred. Lots of researchers have focused on productivity analysis in coastal areas and also on normal land. But none of them focused on comparative analysis by focusing on these two crucial areas. This study would be a new addition to the existing literature, and the findings could be lessons for farmers in different areas of the country.

The primary objective of this research study is to analyze the comparative profitability and productivity of rice cultivation in coastal and arable land areas of Bangladesh. To achieve this overarching goal, several specific objectives have been delineated. Firstly, the study aims to examine the socio-economic conditions of rice farmers in both coastal and arable land areas, providing insights into the contextual factors influencing agricultural practices and outcomes. Secondly, it seeks to compare the profitability of rice production between these two types of land areas, elucidating any disparities in economic returns and efficiency. Additionally, the research aims to identify suitable and viable adaptation measures that can assist farmers in coping with climate change impacts, with a focus on both coastal zones and arable land areas, thereby enhancing resilience and sustainability in rice cultivation practices. Finally, the study endeavors to pinpoint the constraints faced by rice producers, shedding light on the challenges that may hinder productivity and profitability in both coastal and arable land settings. Through the fulfillment of these specific objectives, the research endeavors to provide comprehensive insights into the comparative dynamics of rice production in different geographic contexts,

facilitating informed decision-making and policy formulation for agricultural development and climate resilience in Bangladesh.

2.0 Literature Review

Khan et al. (2016) conducted a study that intended to provide a brief overview of the development of salt-tolerant rice cultivators. The primary objective of their review was to explore and investigate the complex mechanisms of salt tolerance and the current progress in understanding this phenomenon. One conceivable solution to address salinity issues is the development of rice varieties that can endure high salt levels. This can be attained through traditional and modern breeding methods, with the assessment of rice germplasm playing a crucial role in detecting desired traits. The study methodically discusses both conventional methods and modern biotechnology techniques, such as quantitative trait loci (QTL) and marker-assisted selection (MAS). It also explores recent advances in transgenic plants, haploid breeding, and somaclonal variations. Nevertheless, the inadequate knowledge of molecular and genetic mechanisms that facilitate plants to tolerate abiotic stresses remains a substantial hurdle in efficiently developing salt-tolerant rice cultivars.

Gunawardana et al. (1993) did a quantitative study to identify the main factors that affected farmers' supply of paddy to the authorized market in Bangladesh from 1953 to 1989. The study proposed that the supply of paddy by farmers to the authorized market is affected by the open market price of paddy, the guaranteed price of paddy, paddy production, and the quantity of rice bought by consumers in the concession market. The researchers utilized ordinary least squares (OLS) to estimate the desired model utilizing annual aggregate time-series data for the provided timeframe. The regression analysis revealed that higher domestic paddy output, an elevated guaranteed price, and more rice purchases in the concession market led to higher amounts of paddy sold to the government by farmers. Higher open market pricing resulted in decreased amounts of paddy sold. The study found that the fixed price of paddy and the rice sales in the concession market are important policy factors that can be modified to impact farmers' paddy supply in the authorized market. Singh et al. (1998) examined the technical efficiency of rice farming in Bangladesh and identified significant differences in efficiency among various locations and farmer size groups in Satkhira district. The study identified timely transplanting and the correct use of irrigation, fertilizers, and pesticides as the primary factors contributing to high technical efficiency. Jain et al. (2000) examined how price policy affected the income of paddy farmers in Punjab over a period of time. The survey gathered information on the size of land, crop output, total production, and cost per 100 kilograms for 200 farms in three regions of Punjab. Holdings with production costs higher than the Minimum Support Price (MSP) were categorized as affected holdings. In 1981–82, the survey revealed that approximately 64% of farmers in zone I, the traditional paddy-producing area, incurred costs greater than the government-announced Minimum Support Price (MSP). In 1990–91, small farmers with 1-2 hectares were the most impacted group, with 62% of them producing paddy at a cost greater than the Minimum Support Price (MSP). The results showed a declining trend in the proportion of paddy farmers who were able to cover their production expenses with the Minimum Support Price (MSP), indicating that Punjab had become a high-cost producer of paddy in India. Furthermore, the analysis revealed that the proportion of the area benefiting from the price strategy decreased from 65% to 63% over the period. Kumar et al. (2003) examined the market integration of four wholesale paddy markets in Haryana using co-integration and error-correlation techniques. The analysis categorized the time frame as pre-liberalization (October 1978 to September 1989) and post-liberalization (October 1989 to September 2001). The results showed that there was long-term market integration, but short-term price transmission was not observed. The price changes among the marketplaces took approximately 2–3 weeks, with a quicker adjustment process observed in the post-

liberalization phase compared to the pre-liberalization period. Rafeek et al. (2003) examined market integration in rice trade at the farm and retail levels in Hambantota and Kandy markets in Bangladesh. The researchers utilized Ravallion's model to analyze the monthly prices of several grades of rice (Samba and Nadu) at the producer, wholesale, and retail levels from 1997 to 2000. This study revealed a limited level of market integration between farm and wholesale markets, while the wholesale and retail markets exhibited stronger connections. The inefficient transmission of changes in wholesale pricing to farm gate prices resulted in an increased farm-wholesale margin. Elsama et al. (2004) analyzed the patterns of rice production in Satkhira using exponential functions in linear and quadratic formats. The study encompassed the years 1975 to 2000. The results showed a decrease in both area (-3.15%) and production (-1.80%), whereas productivity exhibited a positive but not statistically significant change. The study revealed a notable decrease in both the size and yield of rice, despite an increase in productivity. The study determined that the decrease in area was caused by a combination of low prices and challenges related to cultivation, including high labor and input expenses. The study's recommendation emphasized boosting yield by narrowing the yield gap and removing obstacles to potential output. Akhtar et al. (2007) examined the economic efficiency and competitiveness of Basmati and IRRI rice cultivation in Punjab, Pakistan. They utilized the Policy Analysis Matrix (PAM) to determine that increasing Basmati rice production could lead to higher exports, while the production of IRRI rice showed low economic efficiency and ineffective resource utilization. The study highlighted the lack of competitiveness in Basmati and IRRI rice production at the farm level, as well as the adverse impact of the existing incentive system on farmers. The necessity of eliminating policy distortions to improve economic efficiency and attain competitiveness at the farm level in rice production was emphasized. Bakhshoodeh and Thomson (2001) analyzed the technical efficiency of wheat production in Iran by utilizing a Cobb-Douglas frontier production function. We analyzed Timmer and Kopp indices of technical inefficiency for 164 farms and found that farm size was correlated with inefficiency levels, with small and large farms demonstrating higher technical efficiency compared to medium-sized farms.

The literature review in research is essential as it provides a new perspective for evaluating the current knowledge and information related to the proposed research. It helps in identifying research difficulties and confirming existing findings. Literature guides researchers and helps them achieve significant achievements in their work. This literature review examined research on many elements of firm-level efficiency, yield gap, growth performance, and sustainability of rice production conducted globally, including in Bangladesh. The article emphasized the sections that cover the concepts and theories regarding the involvement and function of rice farmers in both agricultural and non-agricultural tasks. According to the prior literature study, there are gaps that require attention. Although numerous studies have analyzed rice productivity trends, they have not investigated the effects of productivity and efficiency on rice output in Bangladesh. Moreover, there is a scarcity of research that examines the impacts of manufacturing practices on rice production as well as the level of technical inefficiency related to farm size.

3.0 Methodology

This is descriptive-survey research in terms of applied purposes. All the required information to conduct the research has been collected from both primary and secondary sources. The quantitative method has been employed here for assessment and analysis.

Sample Selection and Data Collection

Stratified A random sampling method has been employed to determine the sample where Gopalganj and Khulna districts are picked for the collection of data to represent the coastal and arable land areas, respectively. There are 5 upazilas in Gopalganj: Gopalganj Sadar, Kashiani,

Muksudpur, Kotalipara, and Tungipara, and 4 upazilas in Khulna called Khulna Sadar, Kapulmoni, Sholadana, and Paikgacha. Gopalganj stands on the bank of the river Madhumati and is located at 2300047.67" N 89049 2141" E, though most of the lands are covered with rice. On the other hand, Khulna is a very coastal area, and most of the lands are covered with salinity, where the main crop is predominantly rice. All the data is collected from both primary and secondary sources. Primary data are generated from the researchers' self-administered, closed-ended questionnaire. The questionnaires are distributed and collected personally by the researchers through field work. The questionnaire has two sections. Part 1 will get demographic and socio-economic information, and the second part will consist of rice productivity and profitability across rice-based production systems. Secondary data includes journal papers and relevant websites, which help researchers get ideas about various relevant matters in this research.

For the accuracy of the results, the researcher first launched a pilot survey with 59 respondents and then prepared a final questionnaire with great care. Most of the questions were formed following a category scale and also following an open-ended category. The questionnaire was made by following various previous research papers made based on their respective countries and cultures. The demographic and socio-economic part of the questionnaire consists of 33 questions regarding name, age, village, education, sex, marital status, house condition, electricity connection, received training, cost and return, etc., and the subject-related questions will be 23. From the total of 9 upazilas, 3 villages from Gopalganj and 3 villages from Khulna are randomly selected, and 58 respondents are taken from each village. That means the total number of respondents is 348.

Variable selection and model specification

The production function analysis of rice is used to determine the factors affecting rice production. It gives the technical relationship between dependent and independent variables of the production process. The variables used to determine the factors affecting production function are seed cost, insecticide cost, labor cost, plowing cost, fertilizer cost, and irrigation cost. The Cobb-Douglas production and profit function is used to analyze the research question. SPSS and Excel software would be used to analyze that data.

Collection of data

The data gathered for this study consist of farm yield and various farm inputs such as farm size, planting seeds, soil preparation, fertilizer, irrigation, insecticides, and labor. The data was collected from primary and secondary sources using questionnaires, interviews, and field measurements. Secondary data have been collected for this investigation. The secondary data has been gathered from a variety of government and non-government organizations, including the Yearbook of Agriculture Statistics of Bangladesh (YAS), Bangladesh Bureau of Statistics (BBS), Ministry of Agriculture (MOA), Union Parishad office, various agriculture-related websites, Wikipedia, and others.

Analysis of data

Mainly, two types of analysis techniques were used in this study. These are:

a) Tabular Technique: The tabular technique is a well-known and widely used technique. The tabular technique is the one that is commonly followed to find out the crude association or difference between variables. In this study, the tabular technique was followed to illustrate the whole picture of analysis. The tabular analysis was mainly based on averages, percentages, frequencies, etc.

b) Graphical analysis: Graphical analysis was carried out to focus on the bar diagram and pie chart of the rice farmers. In order to arrive at a meaningful result and to achieve the main objectives of the study, the data were analyzed using graphical techniques.

Analytical technique

Profitability Analysis

To determine the level of profitability in the production process of rice, the following specification of the model is applied:

Gross Margin: It is a deviation between total variable cost from gross return. That is,

Gross Margin (GM)= Gross Return (GR)- Total Variable Cost (TVC)

Net Return

Net return can be defined as the difference between gross return and total cost.

Net Return (NR)= Total Revenue (TR)- Total Cost (TC)

TC= Fixed costs (FC)-TVC

4.0 Socio- economic characteristics of the respondents

Age Distribution of the rice farmers

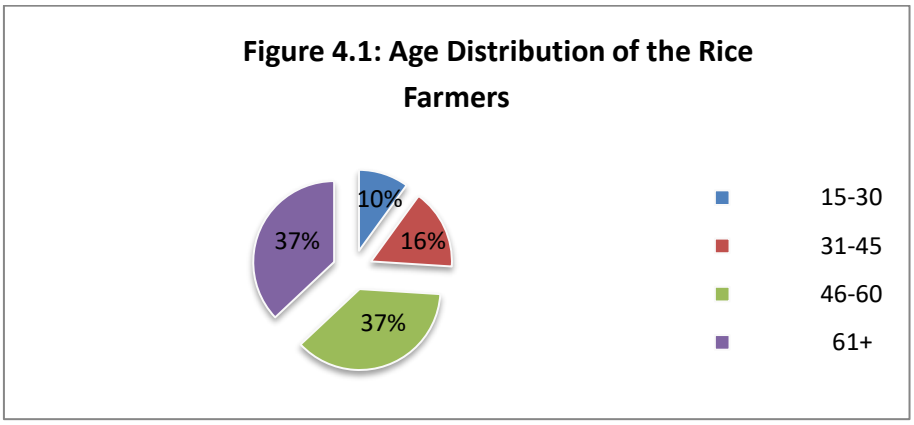
Table 4.1 indicates the age distribution of the respondents in the study area. The maximum age of rice farmers in the study area was found to be between 46 and 60. Rice farmers between 15 and 30 years old are only six in number, while those above 61 years old are 22 farmers. A table has been shown below, comprising various ages of rice farmers in the study area.

Table 4.1: Age Distribution of the Rice Farmers

Age	No of Respondents	Percent (%)
15-30	6	10
31-45	10	16
46-60	22	37
61+	22	37
total	60	100

Source: Field survey 2019

The age of the rice producer was examined by classifying the farmer into four age categories. These groups are 15–30 years, 31–45 years, 46–60 years, and above 60+ years. A figure related to the age distribution of rice farmers in the study area is shown below:



The overall data was collected from six sample villages. The average age of the respondent reveals that the age distribution is the lowest (10%) from 15–30 and the highest (37% from 46–60). Also, age distribution is 37% for 60+ and 10% for 15–30.

Educational status of the farmer

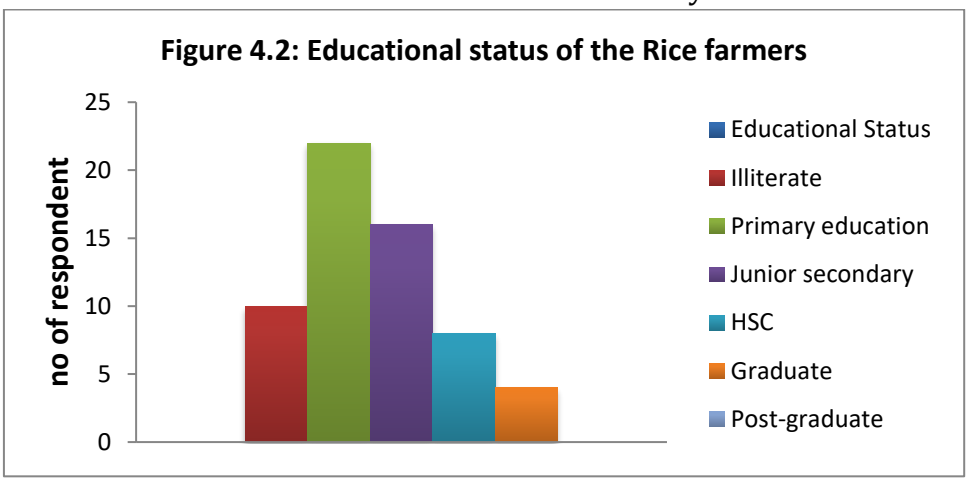
The educational ingenuity of the farming activities is a factor to consider when deciding on successful rice production. The percentage of respondents reflects the fact that most entrepreneurs are academically inclined (see table 4.2). This further justifies the fact that most

of the respondents had knowledge of the subject matter at hand. Hence, the justified reliability of their opinion.

Table 4.2: Educational status of the rice farmer

Educational Status	No of Respondents	Percent (%)
Illiterate	10	17
Primary education	22	36
Junior secondary	16	26
HSC	8	14
Graduate	4	7
Post-graduate	0	0
Total	60	100
Source: Field survey 2019		

A figure related to educational status of rice farmers in the study area has shown below:



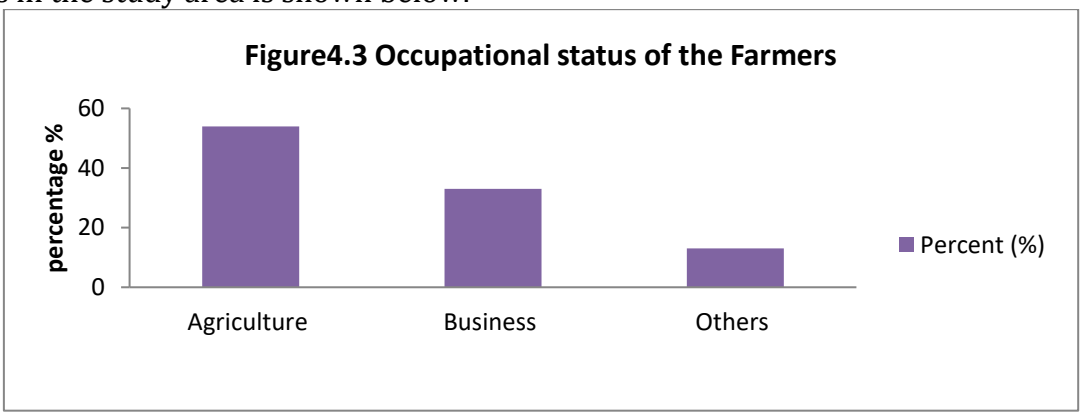
Occupational status of the Respondents

Agriculture was the main source of livelihood for the selected farmers in the study area. Beside agriculture, some farmers were engaged in business and other sectors.

Table 4.3 Occupational status of the Rice farmer

Occupation	No of Respondents	Percentage (%)
Agriculture	32	54
Business	20	33
Others	8	13
Total	60	100
Source: Field survey 2019		

This table (Table 4.3) shows that rice producers mainly depend on agriculture (54%), 33% on business activities, and 13% on others. A figure related to the occupational status of rice farmers in the study area is shown below.



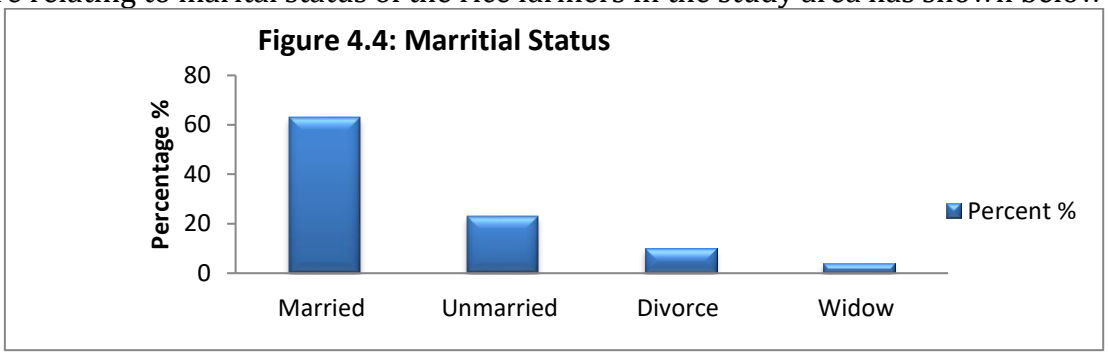
Marital Status of the Rice Farmers in the Study Area

The majority of rice farmers in the study area are married. About 23 percent of farmers are unmarried, 10 percent are divorced, and 63 percent of rice farmers are married in the study area. This is shown in the following table: 4.4.

Table 4.4: Marital Status of Rice Farmers in the Study Area

Marital status	No of Respondents	Percentage %
Married	38	63
Unmarried	14	23
Divorce	6	10
Widow	4	4
Total	60	100
Source: Field survey 2019		

A figure relating to marital status of the rice farmers in the study area has shown below



In the above graph indicate that about a smaller number of farmers are unmarried, few farmers are divorced and 63 percent of rice farmers are married in the study area.

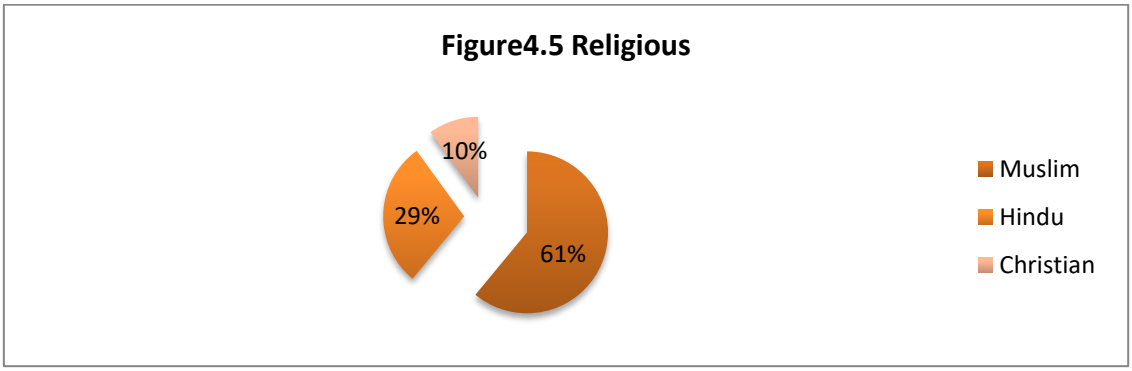
Religious Status of Rice Farmers in the Study Area

The rice farmers in the study's region encompass individuals from diverse castes, creeds, and social statuses. The analysis revealed that Muslims constituted the majority of the sample farmers. About 61 percent of the total rice farmers are Muslims, 29 percent are Hindus, and 6 percent are Christians in the study area. The following table 4.5 illustrates this:

Table 4.5: Religious Status of rice Farmers in the Study Area.

Religion	No of Respondents	Percent %
Muslim	37	61
Hindu	17	29
Christian	6	10
Total	60	100

A figure of pie-chart relating to religious status of the rice farmers in the study area has shown below:



The above graph indicates that about 61 percent of the total rice farmers are Muslims and 29 percent are Hindus in the study area.

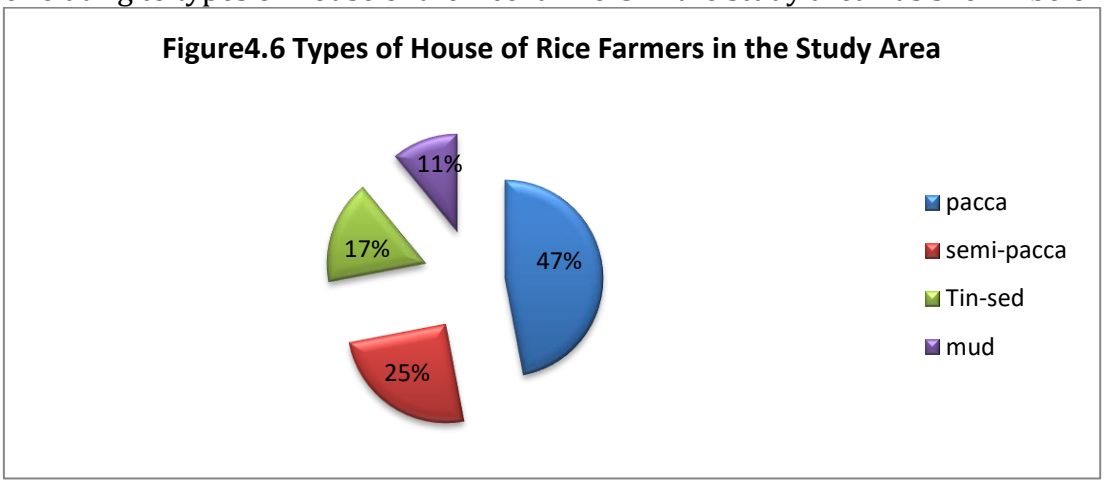
Types of House of Rice Farmers

The majority of the houses of rice farmers in the study area are found to be pacca. About 28 percent of houses are pacca. About 10 percent of the houses are tin sheds, 15 percent are semi-pacca, and only 7 percent of the houses are mud in the study area. A table of house types of rice farmers in the study area is shown below table 4.6.

Table 4.6: Types of House of Rice Farmers in the Study Area

House Type	No of Respondents	Percentage (%)
pacca	28	47
semi-pacca	15	25
Tin-sed	10	17
mud	7	11
Total	60	100
Source: Field survey 2019		

A figure relating to types of House of the rice farmers in the study area has shown below:



The graph indicates that the majority of the respondents house type is pacca (47%)

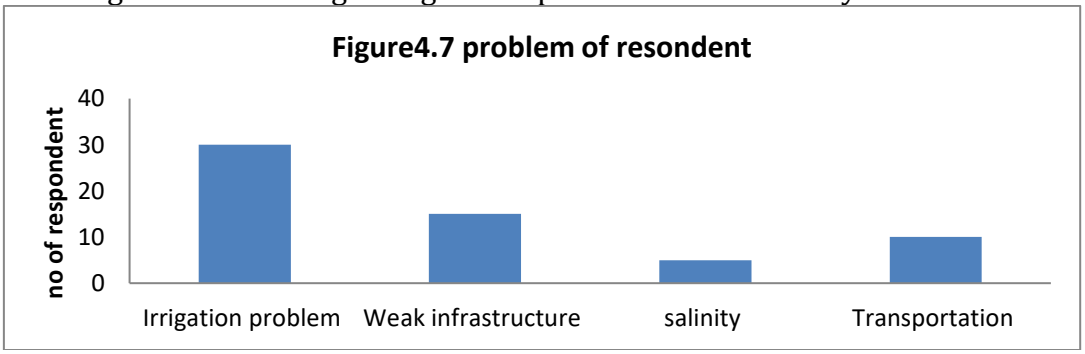
Problems regarding to rice production in the study area

Most of the farmers are facing rice production problems due to irrigation problems in their locality; their percentage is 40. They are also facing weak infrastructure problems, salinity, water logging, and transportation. Those are shown in Table 4.7.

Table 4.7: Problems regarding to Rice production in the study area

problem	No of Respondents	Percent %
Irrigation problem	30	50
Weak infrastructure	15	25
salinity	5	9
Transportation	10	16
total	60	100
Source: Field survey 2019		

A figure relating to Problems regarding to rice production in the study area has shown below:



In the above figure indicates majority of irrigation problems faced by respondents

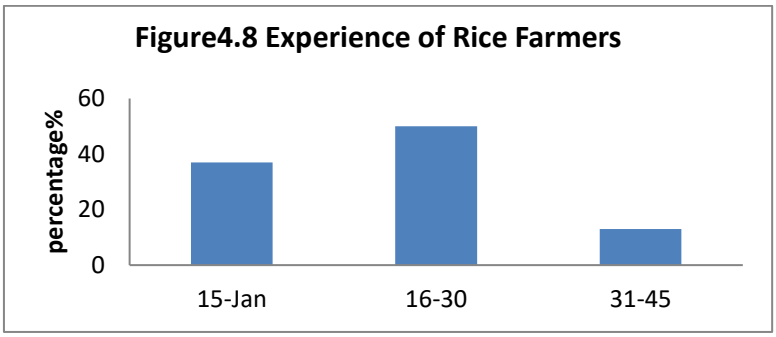
Experience of Rice Farmers

Table 4.8 indicates the age of the cultivating year in the study area. It is found from the study area that; maximum rice farmer's cultivate rice lied between 21 and 30 in the study area.

Table 4.8: Experience of Rice Farmers

Age	No of Respondents	Percent
1-15	22	37
16-30	30	50
31-45	8	13
total	60	100
Source: Field survey 2019		

A figure relating to the age of the cultivating year rice production in the study area has shown below:



The overall data was collected from two sample villages. The average cultivating age of the respondent reveals that the cultivating age is lowest (13% from 31–45) and highest 50% from 16–30 years.

5.0 Analysis and Explanation:

Farmers utilized both purchased and self-provided resources for growing rice. Cost items included human labor, fertilizer, cultivation, pesticides, seed, irrigation, and insecticide expenses (presented in Table 4.9). These input expenses are included for one production period when determining the cost of rice cultivation per bigha. Human labor is essential for various farm tasks such as land preparation, sowing, mulching, weeding, irrigation, pesticide application, fertilizer application, harvesting, and transportation. From the table, it is very clear that there is a huge difference in the costs that are incurred in rice production in arable and coastal land area. In coastal areas, special seeds are needed, and the cost per bigha of seed is almost TK 600 more than the arable land area. Not only that, there is a mentionable difference between the irrigation costs. In coastal areas, the cost of irrigation is almost five times greater than in arable areas. But there is an exception. The insecticide cost is less in coastal areas than arable land. On the other hand, there is a very small difference in fertilizer cost. Labor costs in coastal areas are higher than in arable areas, indicating that coastal rice cultivation requires more care. Profit is also almost double in arable land than in coastal areas for rice production.

Table 4.9: Cost of rice production (Per Bigha)

Explanatory variables	arable land	Coastal Area
Seed cost	212.4137931	833.7931034
Labor cost	2034.482759	3441.37931
Cultivation cost	544.8275862	1170.689655
Insecticides cost	739.3103448	401.8965517
fertilizer cost	1680.931034	1713.62069
irrigation	458.6206897	2387.931034
return	27025.86207	14560.68966

We made the assumption that the production of rice was affected by six different cost categories in addition to other considerations. In order to conduct a production function analysis of the farmers' efficiency in rice production, six different variables that explain the

phenomenon were taken into consideration. The sample farmers make use of a variety of factors in order to produce rice. These factors include seed, human labor, irrigation, cultivation, insecticides, and the cost of fertilizer.

Table 4.10: Estimated values of co-efficient and related statistics of Cobb-Douglas production function is presented model for rice production.

	Coastal Area			Arable Land area		
Explanatory variables	Coefficients	t Stat	P-value	Coefficients	t Stat	P-value
Intercept	10.92591343	8.532088	2.889E-08	7.39631896	4.485292	0.000204
Seed cost	0.017599858	0.236763	0.81513455	0.045529511	1.411937	0.172615
Labor cost	-0.08815257	-1.39741	0.17688098	-0.165459591	-3.14996	0.004832
Cultivation cost	-0.03727022	-0.33207	0.74312905	0.037715476	0.744325	0.464928
Insecticides cost	0.035026153	0.255918	0.80050441	0.123233084	2.475689	0.021897
Fertilizer cost	-0.07365048	-0.82868	0.41660315	0.637762768	2.603278	0.016596
Irrigation	-0.01468176	-0.26726	0.79187714	-0.3172991	-3.03956	0.006231

Table 4.10 showed that most of the coefficients in coastal areas have a negative sign. That means if the labor cost, cultivation cost, fertilizer cost, and irrigation cost increased by 1, respectively, by keeping other things constant, then the revenue would decrease by 8%, 3%, 7%, and 1%. There is still scope for increasing labor and insecticide costs, which will contribute to the increase in revenue or profit. On the other hand, most of the coefficients in arable land areas are positive. Labor, insecticides, fertilizer, and irrigation costs can significantly influence revenue at 0.04%, 2%, 1%, and 5 and 6% significance level. In the case of labor costs, if one unit cost is increased (keeping other things constant), then revenue will decrease by 16%. So, labor costs have to decrease to get more gross profit. On the other hand, if the cost of insecticides and fertilizer is increased by 1 unit, respectively, then revenue will increase by 12% and 63%, respectively. This means there is an opportunity to increase gross return by using more quality fertilizer in arable land areas. The co-efficient of multiple determinations R square for coastal areas is 0.11, which indicates that the explanatory variables included in the model explained 11% of the variation in rice production. On the other hand, in the case of arable land areas, the R square is.62, which indicates that the explanatory variables included in the model explained 62% of the variation in rice production.

6.0 Conclusion

The existing state of food production is inadequate to fulfill the needs of the burgeoning demands of Bangladesh's domestic population, while this insufficiency is estimated to exacerbate in the future due to the rapid and considerable increase in the population compared to the rate of food production. Rice, a staple food in terms of consumption, is steadily gaining momentum annually. As a result, it becomes dominant to ratify measures that not only address this insufficiency but also propel rice production developments, ensuring productivity across various landscapes. The research's primary objective was to evaluate the relative efficiency and financial viability of rice cultivation in the coastal and arable regions of Bangladesh. This examination effectively identified various factors, such as the cost of seeds, labor, fertilizers, insecticides, plowing, and irrigation, that significantly contribute to the overall profitability. Therefore, the outcomes of this research can be effectively applied to improve supportive policies, breed innovative concepts, and formulate appropriate strategies to enhance the cultivation of rice in the aforementioned coastal and arable areas. Furthermore, the utmost importance of integrating socio-economic circumstances and the educational backgrounds of rice farmers into the policy-making processes was a strong focus of the study. Moreover, the research aimed to render instrumental data for successive analysis and to establish the foundation for suitable policies improving rice production in the coastal and arable areas of Bangladesh. Overall, this study offers significant insights for policymakers in their endeavors

to augment productivity, profitability, and sustainability in the realm of rice cultivation within the nation.

7.0 Research limitations and future directions of research

The study's limited sample size is a constraint, as the data was only collected from six villages in Gopalganj and Khulna districts. This narrow focus results in the data not being representative of the entire coastal and arable land area of Bangladesh. Additionally, the lack of generalizability means that the research findings may not seamlessly apply to areas or countries facing diverse socio-economic conditions and agricultural practices. Another limitation is the reliance on primary data, which was collected through questionnaires and interviews. This method may be prone to response bias or inaccuracies. Additionally, the analysis has a limited scope as it focused on selected variables such as seed cost, labor cost, fertilizer cost, insecticide cost, plowing cost, and irrigation cost. This means that other factors that could potentially affect productivity and profitability may not have been considered. Lastly, the research may not capture the long-term trends and dynamics of rice production in coastal and arable land areas due to its reliance on cross-sectional data. A more comprehensive investigation of these limitations may provide valuable perspectives for policymakers and professionals seeking to encourage sustainable rice cultivation. Additional opportunities for research should explore these intricacies. In doing so, further research can contribute to a more comprehensive understanding of the dynamics, including rice production in Bangladesh.

References

Adams, K. (2007). Externalisation vs Specialisation: What is Happening to Personnel? *Human Resource Management Journal*, *1*, 40–54. https://doi.org/10.1111/j.1748-8583.1991.tb00236.x

Adler, P. S. (2003). Making the HR Outsourcing Decision. *MIT Sloan Management Review*. https://sloanreview.mit.edu/article/making-the-hr-outsourcing-decision/

Agrawal, T., Hirons, M., & Gathorne-Hardy, A. (2021). Understanding farmers' cropping decisions and implications for crop diversity conservation: Insights from Central India. *Current Research in Environmental Sustainability*, *3*, 100068. https://doi.org/10.1016/j.crsust.2021.100068

Akhtar, W., Sharif, M., & Akmal, N. (2007). Analysis of Economic Efficiency and Competitiveness of the Rice Production Systems of Pakistan's Punjab. *THE LAHORE JOURNAL OF ECONOMICS*, *12*. https://doi.org/10.35536/lje.2007.v12.i1.a7

Ali, S. Z., Sidhu, R. s, & Vatta, K. (2012). Effectiveness of Minimum Support Price Policy for Paddy in India with a Case Study of Punjab. *Agricultural Economics Research Review*, *25*, 231–242.

Bagozzi, R. P. (1984). A Prospectus for Theory Construction in Marketing. *Journal of Marketing*, *48*(1), 11–29. https://doi.org/10.1177/002224298404800102

Baron, R., & Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182. https://doi.org/10.1037//0022-3514.51.6.1173

Bartol, K. M. (1983). Turnover among DP personnel: A casual analysis. *Communications of the ACM*, *26*(10), 807–811. https://doi.org/10.1145/358413.358433

Beckers, A. M., & Bsat, M. Z. (2002). A Dss Classification Model for Research in Human Resource Information Systems. *Information Systems Management*, *19*(3), 1–10. https://doi.org/10.1201/1078/43201.19.3.20020601/37169.6

Chin, W., & Newsted, P. (1999). Structural Equation Modeling Analysis with Small Samples Using Partial Least Square. *Statistical Strategies for Small Sample Research*.

Dev, K. (2023). *Institutional Arrangements to Enforce the Minimum Support Price (MSP) Policy Effectively in India: A Case Study of Wheat and Paddy Production in Punjab* (SSRN Scholarly Paper 4467499). https://papers.ssrn.com/abstract=4467499

Esa Abrar Khan, N. M. (2017). SCP in Bangladesh: The Brown Hope of Hazaribagh and the Golden Fibre of Bangladesh. In P. Schroeder, K. Anggraeni, S. Sartori, & U. Weber, *Sustainable Asia* (pp. 105–131). WORLD SCIENTIFIC. https://doi.org/10.1142/9789814730914_0005

Ferrell, O. C. (1979). *Conceptual and theoretical developments in marketing*. American Marketing Association.

Finance Division, Ministry of Finance. (2023). *Bangladesh Economic Review 2023*. https://mof.gov.bd/site/page/44e399b3-d378-41aa-86ff-

8c4277eb0990/http%3A%2F%2Fmof.gov.bd%2Fsite%2Fpage%2F44e399b3-d378-41aa-86ff-8c4277eb0990%2FBangladesh-Economic-Review

G.Carmines, E., & A.Zeller, R. (1979). *Reliability and Validity Assessment*. SAGE Publications, Inc. https://doi.org/10.4135/9781412985642

Gunawardana, P. J., & Quilkey, J. J. (1993). Determinants of Paddy Sales by Farmers on Official Market in Sri Lanka, 1953-1989. *Indian Journal of Agricultural Economics*, *48*(4). https://econpapers.repec.org/article/agsinijae/274909.htm

Joshi, P. K., Gulati, A., Birthal, P. S., & Tewari, L. (2004). Agriculture Diversification in South Asia: Patterns, Determinants and Policy Implications. *Economic and Political Weekly*, *39*(24), 2457–2467.

Khan, S., Javed, M. A., Jahan, N., & Manan, F. (2016). A Short Review on the Development of Salt Tolerant Cultivars in Rice. *International Journal of Public Health Science (IJPHS)*, *5*, 201. https://doi.org/10.11591/ijphs.v5i2.4786

Kumar, P., & Sharma, R. K. (2003). Spatial price integration and pricing efficiency at the farm level: A study of paddy in Haryana. *Indian Journal of Agricultural Economics*, *58*, 201–217.

Laumer, S., Maier, C., Weitzel, T., & Eckhardt, A. (2012). The Implementation of Large-Scale Information Systems in Small and Medium-Sized Enterprises—A Case Study of Work-and Health-Related Consequences. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 3159–3168. https://doi.org/10.1109/HICSS.2012.574

Rao, C. H. H., & Gulati, A. (1994). Indian Agriculture: Emerging Perspectives and Policy Issues. *Economic and Political Weekly*, *29*(53), A158–A169.

S, D., Sl, J., Gk, C., Cm, P., M, C., & R, K. (2020). *Crop diversification – to ensure and promote sustainable natural resources use.* http://krishi.icar.gov.in/jspui/handle/123456789/43627

Sharma, D. S. K. (2013). *DOHA NEGOTIATIONS AND DOMESTIC SUPPORT TO INDIAN AGRICULTURE SECTOR*.

U, D. L. (2020). Growth and Instability Analysis of Area, Production and Productivity of Paddy in Kerala, with Special Reference to "The Kerala Conservation of Paddy Land and Wetland Act, 2008." *International Journal of Agriculture Environment and Biotechnology*, *13*(1). https://doi.org/10.30954/0974-1712.1.2020.12

Vijaya Bhaskar, A. V., Nithya, D. J., Raju, S., & Bhavani, R. V. (2017). Establishing integrated agriculture-nutrition programmes to diversify household food and diets in rural India. *Food Security*, *9*(5), 981–999. https://doi.org/10.1007/s12571-017-0721-z

Cite this article:

Mahfuja Akter, Mabia Khatun, & Zahidul Islam (2024). Comparative Profitability and Productivity Analysis of Rice Production in Coastal and Arable Land Areas of Bangladesh. *International Journal of Science and Business, 34* (1), 13-25.
DOI: https://doi.org/10.58970/IJSB.2332

Retrieved from http://ijsab.com/wp-content/uploads/2332.pdf

Published by