

RESEARCH ARTICLE

ANALYSIS OF THE ECONOMIC OF RICE (*Oryza sativa L.*) FARMING IN NEPAL'S KAPILVASTU DISTRICT

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ABSTRACT

Rice is an annual plant in the Poaceae family. It can be produced across Nepal, from the plains to the mountains, and is the country's main food crop. A study was conducted to look at the production, economics, and factors affecting the gross return of rice production in 2022 in the Kapilvastu area of Nepal, where a rice super zone was created under the Prime Minister Agriculture Modernization Project. (PM-AMP). A sample of 300 rice growers was selected using a straightforward random selection process. While secondary data was gathered by reading relevant literature, primary data was gathered through an interview technique that has been thoroughly tested. The results showed that smaller farmers' costs to produce rice were higher per hectare (NRS. 180431) than those of larger farmers (NRS. 127289 per hectare). Because the overall B: C ratio was larger than 1, the study finds that investing in rice farming was economically viable in the studied area (1.19). The discovery will aid farmers in considering the necessity to replace human and bullock labor with farm machinery. As a result, the cost of cultivation would decrease as rice farming's productivity and financial returns increased.

KEYWORDS

Costs_of production, Gross profit, Sample, Benefits cost ratio.

1. INTRODUCTION

Rice (*Oryza sativa L.*) is the staple food of more than 50% of the world population (FAO, UN). About 90% of the global production is in Asian region where about 60% of the world population is living (UN) and consumed about 90% of the global rice production. In Asia, major rice producing countries are India, China, Japan, Philippines, Indonesia, Malaysia, Myanmar, Korea and Pakistan etc. In terms of land used, production, and food security, rice is the most significant food crop. It is the most preferred staple food crop in Nepal and provides more than half of the nation's caloric needs. Currently, it accounts for more than half of the nation's overall production of food grains and is cultivated on half of the country's total cropped land. In the fiscal year 2020/21, it covers over 1.50 million hectares and produces around 5.6 million tons at a productivity of 3.73 tons per hectare (DOA, 2022). Additionally, it provides the primary means of support for more than two-thirds of farm households.

Similar to this, up to 90% of the total cultivation areas in the kapilvastu district, which totals 71200Ha, are currently under cultivation (MOALD2022). The Nepalese district of Kapilvastu has 12ha of land planted with spring rice (MOALD2020/21). The output of rice types in the Kapilvastu area greatly varies from one another due to environmental factors and farming techniques (DADO, 2015). To increase agricultural output, it is necessary to examine the economic factors affecting the rice varieties planted in the district. The purpose of the current study is to examine the Benefit Cost Ratio, Gross Return, Gross Margin, Costs of Production, and Cultivation Issues in the Three Municipalities, namely Bhuddhabhumi Municipality Wards 1 and 2, Shivaraj Municipality Ward No. 6, and Krishnanagar Municipality Wards 4 and 6 in the kapilvastu district of Nepal.

2. MATERIALS AND METHODS

2.1 Study Area

The study was carried out in the Kapilvastu district. The study was conducted in Bhuddhabhumi Municipality wards 1 and 2, Shivaraj Municipality ward no. 6 and Krishnanagar Municipality wards 4 and 6. The site was selected with realizing the potentiality of the district for rice production, where rice block is established under PM-AMP to increase the productivity of rice and put more emphasis on its commercialization.

2.2 Samples and Sampling Methods

300 rice farmers were sampled, and the sample was chosen using a straightforward random sampling procedure. A ward was selected based on the importance of the rice block, three municipalities were selected based on market access and topographic differences, and then households were selected from each ward. The sampling frame, which was typical of the entire population of the research area, yielded 76 household samples in total. The primary data was gathered between June and September 2022 utilizing a pre-tried interview plan. To gather general information and validate the results of the household survey, focus groups and key informant interviews (KII) were undertaken. The pertinent secondary data was gathered from books, journal articles, joint publications, publications of governmental and non-governmental organizations, etc.

2.3 Methods and Techniques of Data Analysis

The field data, both qualitative and quantitative, were initially coded. Microsoft Excel and the Statistical Package for Social Science (SPSS) were used to enter and analyze the data in order to make the appropriate

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inferences. Based on their 2-hectare average cultivation area, the farmers were divided into two groups: small farmers and large farmers. Small farmers were those with up to 2 hectares of land, whereas large farmers were those with more than that amount of land. To arrive at the conclusions, the data on this group of farmers was analyzed and compared.

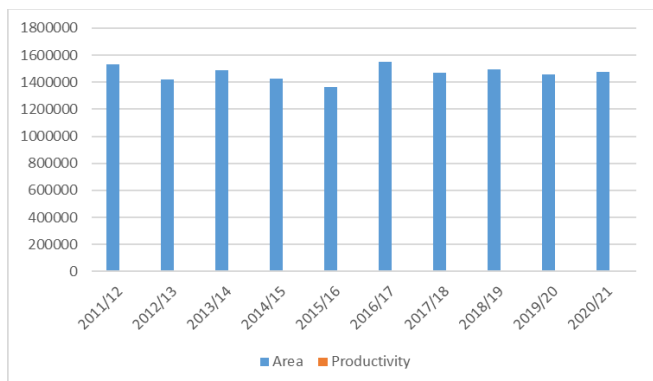


Figure 1: Trend showing rice area and productivity in Nepal (source:MoALD,2022)

2.4 Costs of Production

The sum of all fixed costs and variable costs is the total cost of production. Since rice is a crop with a short growing season, it was the sole variable cost used to determine the cost of production. In accordance with the method employed by (Sapkota et al., 2018).

Total cost= cost of seed +cost of fertilizers+ cost of labour+ cost of land preparation +cost of other inputs.

2.5 Gross Profit

The gross return is what is obtained from grains as well as byproducts (such as straw). It was calculated by using the same formula as that employed by (Dhakal et al., 2019).

Gross Profit= {(price of rice seed x total amount of rice seed)} + {(Price of rice byproduct x total amount of rice byproduct)}

2.6 Gross Margin

The gross return, which was determined by deducting the whole cost of cultivation from the gross return, is distinct from the gross margin. Analysis of any business using gross margins is straightforward and rapid. The formula employed by was applied to calculate it (Sapkota et al., 2018).

Gross Margin = Gross return - Total variable cost

2.7 Benefit-Cost Ratio

The benefit-cost ratio can be used to swiftly and readily determine the economic performance of any organization, including the agricultural sector. It is the proportion of gross return to overall cost. Using the following formula, which is also employed by, BCR was determined (Subedi et al., 2020).

Benefit –cost ratio = Gross return/Total variable cost

2.8 Problems of Rice Production

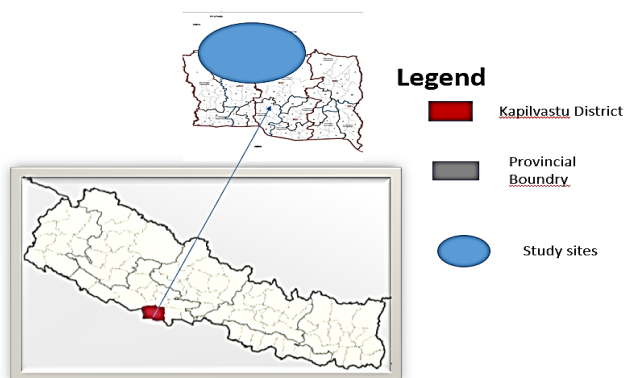


Figure 2: Map of the study area showing research site.

The main issues with rice production and the challenges that the district's rice growers confront were determined based on on-the-ground observations and casual conversations with the relevant stakeholders. Farmers were asked multiple questions in order to pinpoint the main issues affecting rice output in the study area. It was decided that the issues with having a maximum frequency were more significant. The issues were ordered in accordance with the frequency of each issue as determined by the household survey.

3. RESULTS AND DISCUSSION

3.1 Gross Return from Production

The return from the grain and straw are included in the gross return of rice farming. NRs. 218446.6 per hectare was the overall return from rice production, which is much more for small farmers than for large farmers (Table 1). Small farmers saw high returns because of their high output. Straw made just 29% of the gross return, while grain generated 71% of it (Table 1). A group researcher who reported that grains and straw contribute 72.65% and 27.35%, respectively, to gross return, confirm this conclusion (Bhusal et al., 2020). According to a study done in Kathmandu, total return was lower (NRs. 163114/ha) than what was discovered in our study.

Returns (NRs.)	Small farmers (n ₁ =55)	Large farmers (n ₂ =21)	Overall (n=76)	Mean difference
Rice grain	168572 (72)	123873 (70)	156221 (71)	44699
Straw	65800 (28)	52864 (30)	62225.6 (29)	12936
Total	234372 (100)	176737 (100)	218446.6 (100)	57635

Source: Field survey,2022

Note: Figures in parentheses indicate the percentage.

3.2 Gross Margin and Gross Profit Ratio

In the case of large farmers compared to small farmers, the average profit margin was (NRs.271816.7 per ha) (Table2). The total gross profit ratio was 0.13, notably higher for large farms (0.22) and significantly lower for small farmers (0.09) (Table 2). Similar to our findings, discovers that Gorkha's gross profit ratio is lower (0.12) than ours (Paudel, 2021).

Variables	Small farmers (n=55)	Large farmers (n=21)	Overall (n=76)	Mean difference
Gross Margin (NRs.)	24368	36849	271816.7	-12481
Gross Profit	0.09	0.22	0.13	-0.12

Source: Field survey, 2022.

3.3 Benefit Cost Ratio

In the Kapilvastu district, rice farming is economically viable based on the overall benefit-cost ratio of 1.19, which is somewhat higher than one (Table 3). The research area's average B:C ratio was marginally higher (1.17) than it was in Gorkha (Paudel, 2021). When it came to farmers, the large farmers' B:C ratio was noticeably larger than the small farmers.

Variables	Small farmers (n ₁ =55)	Large farmers (n ₂ =21)	Overall (n=76)	Mean difference
B:C	1.16	1.29	1.19	-0.13

Source: Field Survey ,2022

3.4 Cost of Production

66% of the entire cost was accounted for by the labor cost, which made up the largest portion of the cost (Figure 3). These studies demonstrate that smaller farmers' labor costs are much greater than those of large farmers. Our research demonstrates that dung is more expensive than chemical fertilizer. It was discovered that the cultivation's total variable cost per hectare was NRs. 165747ha. Our results in the Dang and Gorkha conditions are higher than those of with average cultivation costs of NRs. 116311ha and NRs. 154886ha, respectively (Sapkota et al., 2021; Paudel et al., 2021). The higher cultivation costs were associated with rising fertilizer prices, and machinery costs are also to blame for the higher variable costs. Similar to this, time series analysis demonstrates that the cost of rice production is rising daily, resulting in higher market prices for rice than in previous years.

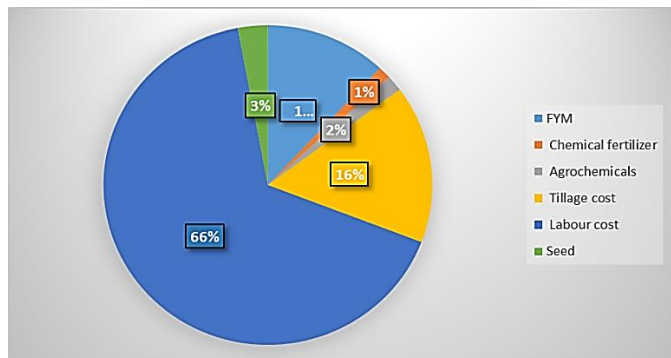


Figure 3: Contribution (%) of variable resources to total cost of rice cultivation. (Source: Field survey, 2022)

3.5 Problems of Rice Production

Farmers in the study areas deal with a number of production-related issues. In Table 4, the identified issues with rice cultivation in the research region are listed. The outcome demonstrates that among production issues, limited access to better seeds, fertilizer, and agrochemicals in time, quality, and quantity is viewed as the biggest issue, followed by damage from diseases, pests, and wild animals that results in inefficient use of production inputs. Land fragmentation was the second biggest issue, followed by a lack of technical expertise and support, labor scarcity, a lack of automation, and a lack of adequate irrigation and drainage systems (Table 4).

Table 4: Ranking of The Present Problems Of Rice Production.		
Problems of rice production	Frequency	Rank
Poor access to improved seed, fertilizer and agrochemical in time, quality and quantity	35(46.5)	I
Damage of crop by diseases, pests and wild animals	34(45)	II
Labor shortage and lack of mechanization	27(35)	IV
Lack of technical knowledge and support	33(44)	III
Lack of proper irrigation and drainage facilities	21(32)	V
Land fragmentation	17(24)	VI

Source: Field Survey 2022

4. CONCLUSION

The majority of households rely primarily on agriculture for their income, and the majority of them only do it as their primary occupation. Due to the continued use of the traditional system of rice cultivation, this study demonstrates that rice yield is lower than the national average, highlighting a potential area for development. As a result, providing necessary inputs on time, in sufficient quality, and in sufficient amount, which is a significant issue in rice production, aids in boosting output and productivity. The study demonstrates that rice cultivation investment was financially feasible because the entire B: C ratio was higher than 1. Because large-scale farming reduces the cost of cultivation, it has a larger benefit-cost ratio than small-scale farming. Therefore, rice cultivation would be an economically more feasible commercial enterprise with higher profitability and food supply if rational resource utilization could be ensured.

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