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# ASSESSING THE ECONOMIC PROFITABILITY OF FOODGRAIN CULTIVATION IN SANGLI DISTRICT

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## ABSTRACT

The study investigated the foodgrain production, cultivator's income and profitability derived from foodgrain cultivation in Sangli District. Primary data obtained from 20 villages and 384 respondents in 2021 which allowed to assess the cultivation area as well as productivity and economic returns from Rice, Wheat, Bajara, and Jowar. Rice proves the most financially profitable crop for farmers of the Sangli district because it generated the highest income per hectare. Statistics inferences shows that rice cultivation produces 50.41 quintals of yield per hectare which exceeds all other selected foodgrains. The Jowar delivers the maximum gross monetary income per hectare at Rs. 143039 followed by Bajra (Rs. 138150) then Rice (Rs. 119468) and finally wheat (Rs. 117,121). Rice stands as the most financially profitable crop because it offers the highest benefit-cost ratio (1.69) when compared to wheat (1.48) and bajara (1.35) and jowar (1.30). Results from the study demonstrated major distinctions between cultivation cost and income across all the selected foodgrain crops. Better financial assistance coupled with technological innovation and efficient machinery are essential to improve productivity and profitability of foodgrain in study region. Strategic government policies are needed to stabilize cultivation costs and enhance farmer income in Sangli District.

**Keywords:** Foodgrain Production, Profitability, Productivity, Cost Analysis, Sangli District, Agricultural Income, Benefit-Cost Ratio

## 1. INTRODUCTION

Agriculture functions as the main driving force behind the economic development of Sangli District because farmers are cultivating foodgrains as a main source of their livelihood. The Sangli district covered with a wide range of suitable agricultural environments which support to the growth of rice, wheat, bajara and jowar and other food grains. Farmers of the Sangli district are confronting three major difficulties viz. changing market rates, varying crop outputs and continuously increasing input expenses, because of which their income and profitability has declining trend. The agriculture of Sangli District is depending on various elements starting from soil quality access to irrigation facilities, modern farming practices and ending in government-backed support systems. Farmers encounter difficulties in obtaining satisfactory profits because they must maintain high expenses and their agriculture activities are rely on rainfall conditions and they do not have enough borrowing capacity. The earnings of these farmers suffer from price fluctuations after harvest and the loss of stored products. Agricultural development is heavily depending on government implementations of crop insurance schemes along with minimum support price (MSP) and technological improvement programs. The present study investigated the foodgrain production of the Sangli district through profitability analysis and cost assessment.

The main issues facing Indian agriculture today are farmer suicides, debt, crop failures, low crop prices, and low returns relative to cultivation costs. Prior to the early 1990s, farmer suicides were uncommon, but in many Indian states, they are now a common occurrence. Between 1990–1991 and 2009–2010, more than two lakh farmers in India took their own lives, with states like Maharashtra, Andhra Pradesh, and Karnataka having the highest rates (Sainath, 2010). Numerous studies have examined these issues since the mid-1990s, when the problem of farmers committing suicides reached serious proportions. Why is this happening in India? Is it because of poor crop cultivation returns? Is it because of monsoon-related failures? Could it be because of increased debt? According to some studies, the main causes of this phenomenon are a lack of institutional credit, a drop in crop productivity, and unfavorable market conditions (Deshpande, 2002; Deshpande and Prabhu, 2005; Reddy and Galab, 2006; Mishra, 2006; Vaidyanathan, 2008). Without giving enough consideration to the advantages that the green revolution offered to farmers and the nation at large, some researchers have blamed the movement for farmer suicides (Vasavi, 2010). Despite the fact that the majority of farmer suicides in India began in the early 1990s, some researchers have linked behavioral and social factors to this phenomenon (Mohanty, 2001; Mohanty and Shroff, 2004; Gyanmudra, 2010). However, they don't address how the farming community's behavioral and social issues could arise out.

## 2. OBJECTIVES OF THE STUDY

The major objectives of the study are as below.

1) To assess the area, production, and productivity of food grains in Sangli District based on empirical data.
2) To evaluate the income levels of foodgrain cultivators.
3) To analyse the profitability of different food grains cultivated in the Sangli District.

## 3. RESEARCH METHODOLOGY

The research relies on primary data which was obtained through 384 farmer respondents from 20 villages of the Sangli District. Productivity and profitability were studied using statistical analysis tools that included mean, standard deviation and coefficient of variation. The benefit-cost ratio showed economic viability among different crops for evaluation purposes.

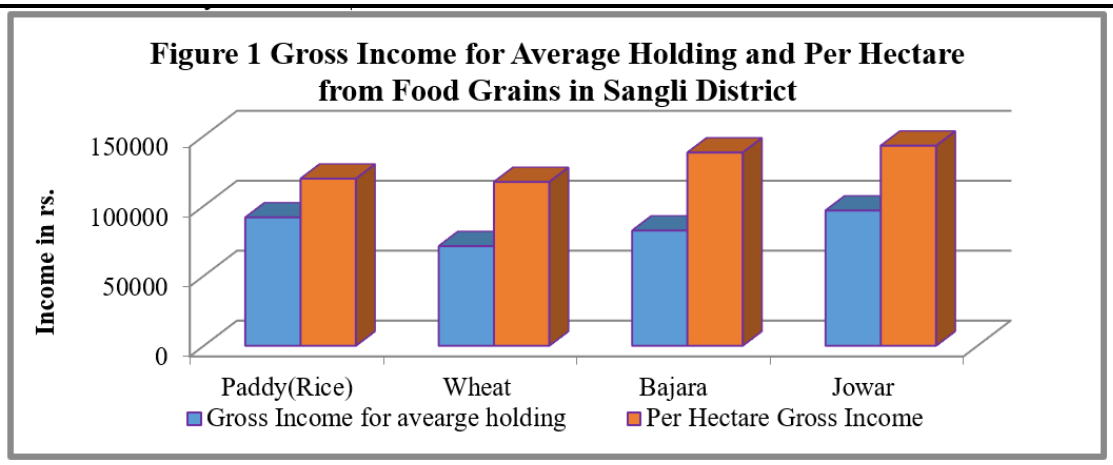
## 4. DATA ANALYSIS AND INTERPRETATION

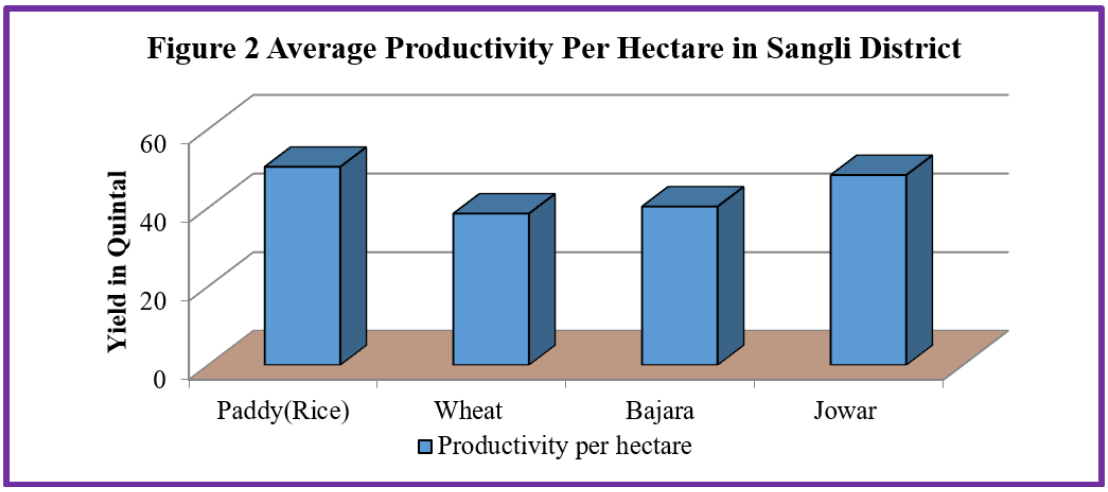
Figures 1 to 3 and Table 1 display the area, productivity, and gross income of the chosen food grain growers in the Sangli district. The data shows that the sample cultivators planted less than one hectare of rice, wheat, bajara, and jowar on average. Respondent cultivators cultivate an average of 1.92 acres of rice, 1.52 acres, 1.49 acres, and 1.69 acres of wheat, bajara, and jowar, respectively. It indicates that there is a larger area grown for rice.

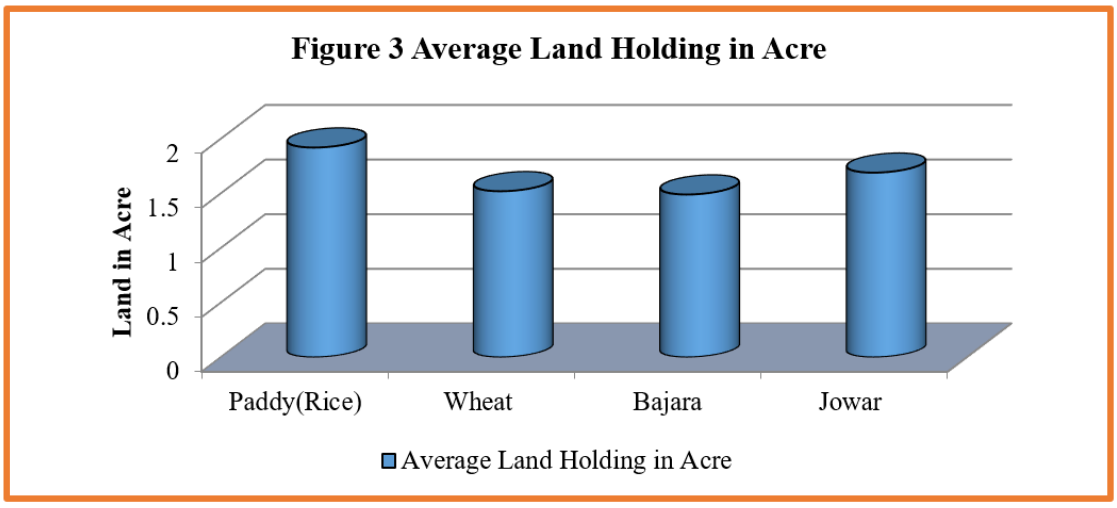
**Table 1** Area, Production, Productivity and Income of the Food Grain Cultivators of the Sangli District

| **Food Grains** | **Area** | **Production** | | | | **Productivity** | **Gross Income** | |
|---|---|---|---|---|---|---|---|---|
| | Average Area under cultivation ( in Acre) | **Principal Product** | | **Residual Product** | | Productivity per hectare (qunt.) | For Average Holding | Per hectare |
| | | Production (qunt.) | Market Rate | Production (qunt.) | Market Rate | | | |
| Paddy(Rice) | 1.92 | 38.4 | 2280 | 210 | 20 | 50.41 | 91752 | 119468.8 |
| Wheat | 1.52 | 29.92 | 2380 | 0 | 0 | 38.52 | 71210 | 117121.1 |
| Bajara | 1.49 | 33.15 | 2431 | 350 | 5 | 40.31 | 82338 | 138150.4 |
| Jowar | 1.69 | 30.18 | 2866 | 850 | 12 | 48.31 | 96695 | 143039.9 |

**Source** Primary data 2021




Similarly, 38.4 quintal, 29.92 quintal, 33.15 quintal, and 30.18 quintal are the production from the average cultivation land under rice, wheat, bajara, and jowar, respectively. It indicates that, in comparison to the other food grains chosen, rice production is higher. The market rate of the rice, wheat, bajara and jowar is found to Rs. 2280, Rs. 2380, Rs. 2431 and Rs.2866 correspondingly. The residual product is also observed in case of rice, bajara and jowar. By adding the residual income in principal income, we obtained the total monetary income from the food grains. The gross food grain income has calculated by considering average land under cultivation and per hectare of land. Per hectare productivity of

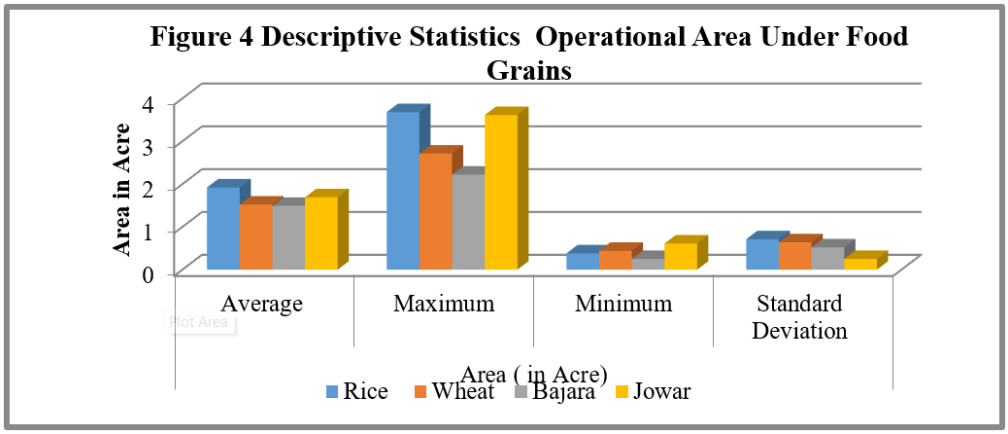
the rice, wheat, bajara and jowar is observed to 50.41 quintal, 38.52 quintal, 40.31 quintal and 48.31 quintal respectively. It means that relatively per hectare rice productivity is more than the other selected food grain crops. For the average amount of land used for rice, wheat, bajara, and jowar cultivation, the monetary income from the food grain is Rs. 91752, Rs. 71210, Rs. 82338, and Rs. 96695, respectively. Since the costs per hectare are calculated independently, the average income per hectare from the chosen food grains is also calculated in the current study. Therefore, the per hectare income of specific food grains is required in order to have uniformity in the units of cost and income. The average rice-related income per hectare is Rs. 119468. Similarly, the average income per hectare from the cultivation of jowar, bajara, and wheat is Rs. 143039, Rs. 138150, and Rs. 117121, respectively.

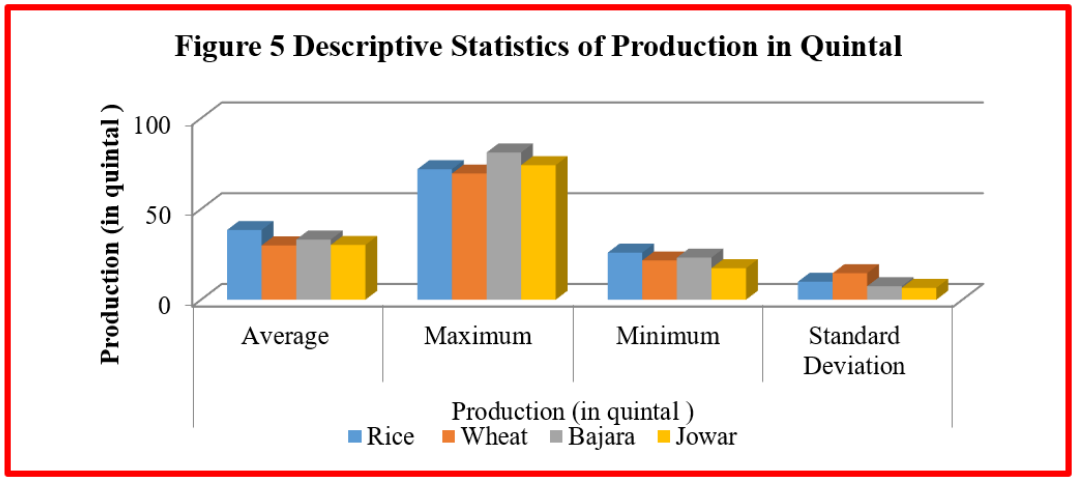
The table 2 and figure 4 to 6 shows the descriptive statistics of the area under cultivation, production, productivity, and income. As stated earlier the 96 cultivators from each crop are taken into account as shown in sample design. It is seen from the data that the average area under rice, wheat, bajara and jowar cultivation is 1.92 acre, 1.52 acre, 1.49 acre and 1.69 acre respectively. The maximum area under rice, wheat, bajara and jowar cultivation is observed to 3.68 acre, 2.71 acre, 2.22 acre and 3.61 acre correspondingly. The minimum area under rice, wheat, bajara and jowar cultivation is observed to 0.38 acre, 0.44 acre, 0.25 acre and 0.61 acre correspondingly. The standard deviation of the area under rice, wheat, bajara and jowar cultivation is found to 0.71 acre, 0.64 acre, 0.52 acre and 0.25 acre correspondingly. Likewise, the coefficient of variance of the area under cultivation of the rice, wheat, bajara and jowar is recorded to 36.98 percent, 42.11 percent, 34.90 percent and 14.79 percent respectively. It implies that there are significant variations in the average area under cultivation of the selected food grain crops in Sangli district.

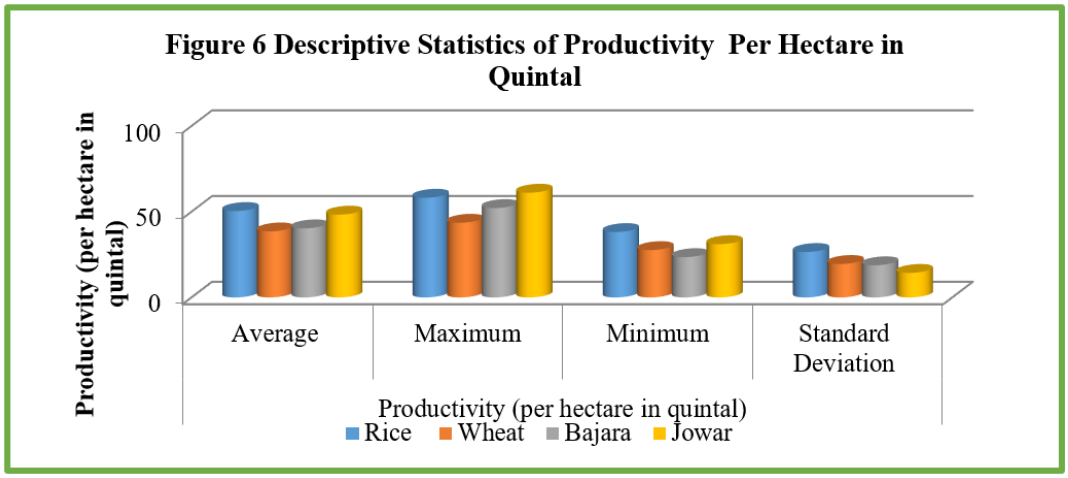
**Table 2** Descriptive Statistics of the Area, Production, Productivity and Income of the Food Grain Cultivators in Sangli District

| **Particulars** | **Descriptive Statistics** | **Rice (N=96)** | **Wheat (N=96)** | **Bajara (N=96)** | **Jowar (N=96)** |
|---|---|---|---|---|---|
| **Area ( in Acre)** | Average | 1.92 | 1.52 | 1.49 | 1.69 |
| | Maximum | 3.68 | 2.71 | 2.22 | 3.61 |
| | Minimum | 0.38 | 0.44 | 0.25 | 0.61 |
| | Standard Deviation | 0.71 | 0.64 | 0.52 | 0.25 |
| | Coefficient of Variance | 36.98 | 42.11 | 34.90 | 14.79 |
| **Production (in quintal )** | Average | 38.4 | 29.92 | 33.15 | 30.18 |
| | Maximum | 71.9 | 69.52 | 81.12 | 74.15 |
| | Minimum | 25.92 | 21.62 | 23.18 | 17.36 |
| | Standard Deviation | 9.92 | 14.61 | 7.45 | 6.52 |
| | Coefficient of Variance | 25.83 | 48.83 | 22.47 | 21.60 |
| **Productivity (per hectare in quintal)** | Average | 50.41 | 38.52 | 40.31 | 48.31 |
| | Maximum | 58.16 | 43.57 | 52.14 | 61.1 |
| | Minimum | 38.15 | 27.61 | 23.52 | 31.1 |
| | Standard Deviation | 26.51 | 19.52 | 18.77 | 14.32 |
| | Coefficient of Variance | 52.59 | 50.67 | 46.56 | 29.64 |
| **Income from average land holding (under cultivation)(In Rs.)** | Average | 91752 | 71210 | 82338 | 96695 |
| | Maximum | 135241 | 125406 | 264561 | 168245 |
| | Minimum | 68500 | 54800 | 51000 | 48500 |
| | Standard Deviation | 26480 | 14569 | 27456 | 19478 |
| | Coefficient of Variance | 28.86 | 20.46 | 33.35 | 20.14 |

**Source** Primary data 2021




Rice, wheat, bajara, and jowar have respective average productions of 38.4 quintal, 29.92 quintal, 33.15 quintal, and 30.18 quintal. It indicates that the Sangli district produces a comparatively higher amount of rice than other food grain crops.

The maximum production of the rice, wheat, bajara and jowar is found to 71.9 quintal, 69.52 quintal, 81.12 quintal and 74.15 quintal respectively. The minimum production of the rice, wheat, bajara and jowar is found to 25.92 quintal, 21.62 quintal, 23.18 quintal and 17.36 quintal respectively. The standard deviation of the production of rice, wheat, bajara and jowar is found to 9.92 quintal, 14.61 quintal, 7.45 quintal and 6.52 quintal respectively. The coefficient of variance of the production of rice, wheat, bajara and jowar is observed to 25.83 percent, 48.83 percent, 22.47 percent and 21.60 percent respectively.

Per hectare average productivity of the rice, wheat, bajara and jowar is found to 50.41 quintal, 38.52 quintal, 40.31 quintal and 48.31 quintal respectively. It means that relatively rice productivity is more than other food grain crops in Sangli district.

The maximum per hectare productivity of the rice, wheat, bajara and jowar is observed to 58.16 quintal, 43.57 quintal, 52.14 quintal and 61.1 quintal respectively. The minimum per hectare productivity of the rice, wheat, bajara and jowar is recorded to 38.15 quintal, 27.61 quintal, 23.52 quintal and 31.1 quintal respectively. The standard deviation of per hectare productivity of rice, wheat, bajara and jowar is found to 26.51 quintal, 19.52 quintal, 18.77 quintal and 14.32 quintal respectively. The coefficient of variance of per hectare productivity of rice, wheat, bajara and jowar is observed to 52.59 percent, 50.67 percent, 46.56 percent and 29.64 percent respectively. It means that there are significant variations in the per hectare productivity of selected food grains.

For rice, wheat, bajara, and jowar, the average land under cultivation yields an average income of Rs. 91752, Rs. 71210, Rs. 82338, and Rs. 96695, respectively.

The average amount of money made from the cultivation of rice, wheat, bajara, and jowar is Rs. 135241, Rs. 125406, Rs. 264561, and Rs. 168245, respectively. The minimum income of the average land under cultivation for the rice, wheat, bajara and jowar is recorded to Rs. 68500, Rs. 54800, Rs. 51000 and Rs. 48500 correspondingly.

The standard deviation of the income of the average land under cultivation for the rice, wheat, bajara and jowar is observed to Rs. 26480, Rs. 14569, Rs. 27456 and Rs. 19478 correspondingly. The coefficient of variance of the income of the average land under cultivation for the rice, wheat, bajara and jowar is observed to 28.86 percent, 20.46 percent, 33.35 percent and 20.14 percent respectively.

## 5. PROFITABILITY ANALYSIS

The profitability in agriculture is always a matter of discussion among the scholars and economists. In the present investigation based on the calculated costs and estimated income the profitability in selected food grain crops is assessed in detail manner. Table 3 shows the selected crop wise profitability in Sangli district.

**Table 3** Profitability Analysis of the Selected Food Grains

| Cost/Income/Profit | Particulars | Rice (N=96) | Wheat (N=96) | Bajara (N=96) | Jowar (N=96) |
|---|---|---|---|---|---|
| **Average Cost (Per Hectare in Rs.)** | **A1** | 43405 | 33557 | 31310 | 28611 |
| | **A2** | 43927 | 34047 | 31711 | 29134 |
| | **A2+FL** | 45379 | 35213 | 32942 | 30278 |
| | **B1** | 44307 | 34265 | 31950 | 29261 |
| | **B2** | 44757 | 34675 | 32470 | 29672 |
| | **C1** | 45759 | 35431 | 33181 | 30405 |
| | **C2** | 46209 | 35841 | 33701 | 30816 |
| | **C3** | 48935 | 37776 | 35454 | 32604 |
| **Average Monetary Income (Per Hectare)** | | 119468.8 | 117121.1 | 138150.4 | 143039.9 |
| **Profitability Per Hectare (In Rs.)** | **Profit at C1** | 73709 | 81690 | 104969 | 112634 |
| | **Profit at C2** | 73259 | 81280 | 104449 | 112223 |
| | **Profit at C3** | 70533 | 79345 | 102696 | 110435 |
| | **Benefit Cost Ratio** | 1.69 | 1.48 | 1.35 | 1.30 |

**Source** Compiled by the Researcher based on field work 2021

To get exact profit figures, there is need of cost and income analysis once again in a single table, because the gross profit is excess revenue over the cost. By deducting total cost from the total income profit has obtained in the present

investigation. Previously the income and cost are explored in detail manner, therefore here only the profit figures are discussed.

Profit at C1 for the rice, wheat, bajara and jowar is observed to Rs. 73709, Rs, 81690, Rs. 104969 and Rs. 112634 respectively. Likewise, profit at cost C2 for the rice, wheat, bajara and jowar is recorded to Rs. 73259, Rs. 81280 Rs. 104449 and Rs. 112223 respectively. The cost C3 is wider concept therefore profit at C3 usually shrinks significantly. The profit at C3 for the rice, wheat, bajara and jowar is recorded to Rs. 70533, Rs. 79345 Rs. 102696 and Rs. 110435 respectively.

The current study also calculated the benefit cost ratio. In contrast to 1.48 for wheat, 1.35 for bajara, and 1.30 for jowar, the benefit cost ratio for rice is 1.69. It means that relatively benefits are more in rice cultivation and jowar crop is relatively less beneficial.

## 6. CONCLUSIONS

Throughout present research, rice is identified as the foodgrain with maximum productivity per hectare among the selected foodgrain crops, but jowar and bajar offered more economic benefits. Rice established the highest profit margins among the analyzed food grains followed by wheat and bajara with jowar coming last. Profitability, farm mechanisation and financial assistance are proved necessary to enhance farmer income because different cost elements significantly influences on these areas. The government should offer financial aid with enhanced agricultural supplies along with innovative farm equipment which can assist to increase the farmer's profitability.

## CONFLICT OF INTERESTS

None.

## ACKNOWLEDGMENTS

None.

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