
Cost of Cultivation and Economic Efficiency of Paddy – Category-wise Analysis

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Article Received: 13/08/2026**Article Accepted:**15/09/2026**Published Online:**16/09/2026**DOI:**10.47311/IJOES.2026.8.09.137

Abstract:

The present study was conducted to analyze the cost of cultivation and economic efficiency of paddy across different categories of farmers. The study was based on primary data collected from 360 respondent farmers, categorized into marginal, small, medium, and large farmers. The results revealed that marginal and small farmers constituted the majority of paddy cultivators, accounting for 40.28 percent and 33.89 percent of the respondents, respectively. The total irrigated land operated by the sample farmers was 706 acres, while the area under paddy cultivation was 358 acres. The study found significant variations in cultivation costs, input utilization, productivity, and profitability among different farm categories. The average cost of cultivation of paddy was Rs. 42,763 per acre. Medium farmers incurred the highest cultivation cost due to higher use of production inputs and improved farm practices. Labour constituted as the largest share of cultivation cost, followed by land rent, tractor operations, and fertilizers. The overall average yield was 23.2 quintals per acre, with large farmers recording the highest productivity of 25.2 quintals per acre. The average income from paddy cultivation was Rs. 48,779 per acre, while the average net income was Rs. 6,016 per acre. Large farmers achieved the highest net income and cost-benefit ratio due to better resource utilization and higher productivity. The overall cost-benefit ratio of paddy cultivation was 1:1.14, indicating that paddy farming was economically profitable across all categories of farmers. However, profitability differences among farm categories highlight the influence of farm size, access to resources, mechanization, and efficient input management. The study suggests that improving access to modern technologies, quality inputs, institutional support, and farm services for marginal and small farmers can enhance productivity, reduce cultivation costs, and improve the economic efficiency of paddy cultivation.

Keywords: Paddy cultivation, cost of cultivation, economic efficiency, farm categories, productivity, profitability, cost-benefit ratio, resource utilization.

Introduction to Agriculture:

Agriculture contributes 4.3 per cent of global GDP but provides employment to 26.4 per cent of the world workforce. In developing countries the share of agriculture sector in the economy is 25 -50 percent of share is in employment point of view. Agriculture sector is playing a crucial role in the economic growth of a country particularly in developing countries. But the counter share of GDP is in between 4.0 per cent to 25.0 per cent and more than the half of the employment by the agriculture sector and more than 60.0 per cent of population directly or indirectly depends on the agriculture sector for their livelihood¹. The agricultural sector in India plays a pivotal role in the contribution to the GDP of the country since independence. In 1950-51 the GDP share of Agricultural sector was about 59.0 percent at present agriculture share in the GDP is about 17.0 percent. In the employment point of view agriculture sector as the main livelihood for the millions of the people in rural India, more than half of the total population getting the employment by the agricultural sector. On the other hand, agriculture sector has been feeding food for not only for the 140 crores of population but exporting to the rest of world².

Agricultural sector has been providing the best platform for the development of industrial sector mainly textile, sugar, edible oil, fertilizer and pesticides and so on and at the same time this sector has the reciprocal demand and supply of industries and service sectors. There is a constant need for raw materials and most of the industries of the country collect their sources of raw materials from the agricultural sector. Half of the income which is generated in India in the industrial sector comes from agricultural-based industries and hence agriculture in India plays a very important role. Agriculture in India is important for the development of the industrial sector and for trading purposes. In addition to some of the agricultural products like fabrics, dairy products, fruits and vegetables basmati rice, sugar tea, coffee, meat and fishers etc are exporting to rest of the world and earning the foreign exchange from the external economies towards the agriculture sector³. Agriculture sector has a significant source of income for the both Governments of Central and State in various tax farms. A few different areas like railways and ports are obtaining significant income to provide the transport facilities for the agriculture commodities⁴. On the other hand, Agriculture is providing a major portion of the basic human needs by giving food and non-food needs. By the harvesting the crops of food and non-food crops agriculture is sustained. The cropping pattern in agriculture broadly divided into two folds like Food crops like Paddy, Wheat, Coarse Grains, and Pulses, and the Non-food crops like Oilseeds, Cotton, and Sugarcane, Establishing crops like Tea and Coffee, and Plant crops like organic products, vegetables, blossoms, flowers, cashews, and coconut. Moreover, some related allied products like milk and dairy items, poultry items, and fisheries are also considered as the cultivation area of agriculture⁵.

Costs of cultivation in Indian Agriculture:

The cost of cultivation in Indian Agriculture has been varying one region to other regions. Generally the cost of cultivation per unit of land it may be one acre or one hectare

of in a particular crop. The cultivation charges of land rent, land taxes, labour charges, cattle management, fertilizers, manure, pesticides, implicit and explicit cost, irrigation charges, interest on all types of capital (credits) and miscellanies' have been including in the cost of cultivation. Commission for Agriculture and Cost and Prices, the ministry of agriculture and farmer's welfare Government of India, directorate of economic and statistics Government of India have developed the various types of cost of cultivation to estimate the specific cost of cultivation in Indian agriculture⁶. But in the gross roots level the estimation of the different cost are not possible to the farming community a majority of the payment to conduct the agricultural operations only on the paid out base which means explicit costs only. The present research article is in the same path way in search of cost of cultivation of paddy per acre.

Importance of Paddy Cultivation:

Paddy is an important cereal crop, more than 50.0 percent of Global population used as the stable food as rice followed by Corn. At present 165.04 million hectares of land under paddy cultivation at world-wide by more than 100 countries. India was estimated to be the global leader of paddy production and about 48 million hectares of area under paddy cultivation. The major countries like China, India, Indonesia, Vietnam and Bangladesh are the Top Five countries are harvesting the paddy crop in the world. As per USDA Government, has been estimated that 514.90 million Tonnes as output of paddy at Global level in 2022 – 23 agricultural seasons. Of the total production, 342.88 million tonnes and its equals to 68.16 percent of paddy output produced by the top Five China, India, Indonesia, Vietnam and Thailand countries 145.95, 125.0, 34.60, 27.23 and 20.10 million tonnes respectively. The average yield of paddy is 4.7 metric tonnes per hectore or 2.1 metric tonnes per acre in 2022-23 agriculture seasons, in case of HYVs, around 17.0 metric tonnes per hectore and 7.6 per acre it was reported in 1999 in China⁷.

According to RBI Handbook statistics 477 lakhs hectares of land under paddy cultivation in 2022 – 23 of India, the total production is 1355.4 lakhs tonnes average yield has been worked out as 2.84 metric tonnes per hectore. The major states are Telangana, Tamil Nadu, Andhra Pradesh, Assam, Kerala are the harvesting the paddy at significant level in India, all the major states together about 80.0 percent of land under paddy⁸.

In Telangana total 23.23 lakhs hectares under paddy cultivation during 2022 – 23 agricultural seasons and its equals to 42.22 percent of India's total 55.02 lakhs hectares of land under paddy cultivation. The average paddy yield is 20.0 qt (49.40qt per hectore) in Karif season and it is 26 qt (64.22 qt per hectore) in rabi season in 2022-23 per acre as satisfactory level when compared to the national level yields. During the 2022 – 23 seasons the districts of Nalgonda, Suryapet, Nizamabad, Siddipet, Jagityal, Yadadri, Karimnagar, Kamareddy, Medak, Khammam, Peddapalli are cultivating the paddy as the significant level in Telangana state. The district of Jagityal is the 6th largest area under paddy in Telangana state with 120729 hectares⁹.

Review of Literature

Bhatia (1967) examined the economics of paddy cultivation and reported that farm size significantly influenced production costs and profitability. Larger farms benefited from economies of scale, while small farms incurred higher labour costs. Bardhan (1973) found that small farmers achieved higher productivity per hectare due to intensive use of family labour. However, their cost of cultivation was relatively high, reducing net returns compared to medium and large farmers. Sharma and Sharma (2002) studied paddy cultivation in Himachal Pradesh and observed that variable costs accounted for the major share of total cultivation cost. Large farmers recorded higher profitability because of better access to mechanization and improved inputs. Raju and Rao (2006) analyzed category-wise economics of paddy farming in Andhra Pradesh. The study revealed that marginal farmers spent more on human labour, whereas large farmers relied more on machinery, resulting in improved labour efficiency and higher returns. Kumar et al. (2010) reported that medium and large farmers achieved better economic efficiency due to timely use of modern technologies, quality seed, and balanced fertilizer application. Small farmers experienced lower efficiency because of limited investment capacity. Singh and Singh (2012) found that labour and irrigation constituted the largest components of paddy cultivation cost. Net income increased with farm size because larger farms efficiently utilized machinery and reduced operational expenses. Chand et al. (2015) evaluated paddy production in northern India and concluded that technical efficiency was higher among medium and large farmers. Marginal farmers faced resource constraints, leading to lower productivity and profitability. Devi and Suhasini (2017) studied the economics of paddy cultivation in Telangana and observed that mechanization reduced labour costs and increased returns. Small farmers, however, had limited access to machinery services, affecting economic efficiency. Kumar and Jain (2019) assessed the cost and returns of paddy cultivation across farm categories. They found that cost of cultivation increased with farm size, but gross and net returns also improved due to higher yields and efficient resource management. Reddy et al. (2022) analyzed paddy farming under changing input prices and reported that rising labour wages and fertilizer costs increased total cultivation expenses. Farmers adopting mechanization and improved production practices achieved better economic efficiency across all farm categories.

Research Gap:

Most previous studies focused either on the cost of cultivation or on economic efficiency separately. Limited research has examined category-wise differences among marginal, small, medium, and large paddy farmers using recent cost structures and efficiency indicators. Existing studies also provide inadequate evidence on the impact of mechanization, input price changes, and resource-use efficiency under present production conditions. Therefore, a comprehensive category-wise analysis of cost of cultivation and economic efficiency of paddy is needed.

Methodology and Sampling Technique

The study is based on primary data collected through a structured interview schedule from 360 sample farmers, with 90 respondents considered 25.0 percent in each selected mandals of Katlapur, Malliala, Buggaram, and Mallapur in Jagityal District in Telangan.

Farmers were classified into four landholding categories of marginal, small, medium, and large based on operational landholdings. The total sample covered 1,641 acres, with an average farm size of 4.56 acres. Descriptive statistical techniques, including frequencies, percentages, averages, and comparative analysis, were employed to examine landholding distribution across farm-size categories in selected mandals. The multi-stage random sampling technique has been adopted for the study. In the Overall, the study selected 360 respondents from 6,469 farmers across the eight sample villages, maintaining an equal sample of 45 farmers from each village. The overall sampling ratio was 17.96:1, indicating that, on average, every 18th farmer was selected for inclusion in the study. This systematic sampling procedure ensured adequate and representative coverage of farmers across all selected villages.

Objectives of the Study

1. To analyze the category-wise cost of cultivation and input utilization pattern of paddy among marginal, small, medium, and large farmers.
2. To examine the differences in productivity, income, and economic efficiency of paddy cultivation across different categories of farmers.
3. To estimate the profitability of paddy cultivation through cost-benefit analysis among various farm categories.

To justify the objectives of the study, the researcher prepared seven simple percentage and average-based tables using primary field data collected from 360 respondent farmers. These tables are directly associated with the title of the article, “Cost of Cultivation and Economic Efficiency of Paddy: Category-wise Analysis,” and provide a systematic understanding of variations among marginal, small, medium, and large farmers. The tables analyze the distribution of farmers, land utilization, cost structure, yield, income, net returns, and cost-benefit efficiency. The findings generated from these tables help to evaluate the differences in resource use, productivity, profitability, and economic efficiency of paddy cultivation across different farm categories.

Table – 1

Category-wise Land Distribution of Respondents Particulars

Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
No. Farmers	145	122	63	30	360
% of Respondents	40.3	33.8	17.5	8.3	100.0
Total Irrigated Land	126	223	212	145	706
Land Percentage	17.4	31.8	30.2	20.5	100.0

Average Size of Irrigated Land	0.86	1.8	3.4	4.8	1.96
Net Operated Land	1.97	3.33	6.03	13.27	4.08

Source: Field Study

Table 1 presents the category-wise land distribution of respondent farmers, which provides the foundation for analyzing the cost of cultivation and economic efficiency of paddy across different landholding categories. Out of the total 360 respondent farmers, 145 respondents representing as 40.3 percent were marginal farmers as the highest, followed by 122 respondents accounting for 33.8 percent who were small farmers. Medium farmers accounted for 63 respondents constituted as 17.5 percent, while large farmers comprised 30 respondents are with 8.3 percent. The predominance of marginal and small farmers indicates that paddy cultivation in the study area is largely undertaken by farmers with relatively limited land resources, making category-wise analysis essential for understanding differences in production costs and economic efficiency.

The total irrigated land operated by the respondent farmers was 706 acres. Small farmers possessed are the highest irrigated land with 223 acres accounting for 31.8 percent, followed by medium farmers with 212 acres constituted as 30.2 percent. Large farmers operated 145 acres accounting for 20.5 percent, whereas marginal farmers cultivated only 126 acres equals to 17.4 percent. Although marginal farmers represented the largest share of respondents, they operated the smallest share of irrigated land, indicating fragmented landholdings.

The average size of irrigated land increased consistently across farm categories from 0.86, 1.80, 3.40 and 4.80 acres for marginal, small, medium and large farmers respectively. Likewise, the average net operated land increased from marginal to large landholdings 1.97 to 13.27 acres and the overall average net operated land was 4.08 acres.

The findings reveal a clear disparity in land distribution among the respondent farmers. While marginal and small farmers both together as 74.1 percent of the total respondents, they operated comparatively smaller landholdings than medium and large farmers. This variation in operational landholding is expected to influence the cost of cultivation, adoption of improved technologies, resource-use efficiency, and ultimately the economic efficiency of paddy cultivation across different farm categories in the study area.

Table – 2**Distribution Respondents and Land under Paddy Cultivation: Category-wise**

Details	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Respondents	145 (40.28)	122 (33.89)	63 (17.50)	30 (8.33)	360 (100.0)
Area under Paddy	102 (28.49)	118 (32.96)	91 (25.42)	47 (13.13)	358 (100.0)

Source: Field Study

Table 2 denotes the distribution of respondent farmers and the area under paddy cultivation across different farm categories of the study. Out of the total 360 respondent farmers, 145 respondents constitutes as 40.28 percent were marginal farmers, followed by 122 respondents are with 33.89 percent who were small farmers, there are 63 farmers accounted for 17.50 percent are medium category, while large farmers are 30 comprised as 8.33 percent as the lowest. The distribution indicates that paddy cultivation in the study area is primarily undertaken by marginal and small landholding categories of the study.

The total area under paddy cultivation was 358 acres. Small farmers cultivated as the largest area under paddy with 118 acres accounting for 32.9 percent, followed by marginal farmers with 102 acres with 28.49 percent. Medium farmers cultivated 91 acres representing as 25.42 percent, whereas large farmers cultivated 47 acres constituted as 13.13 percent.

Within each category, paddy occupied 35.6 percent of the net operated land of marginal farmers, which was the highest among all categories, followed by small, medium and large farmers are with 29.06, 23.95 and 11.81 percent of operated land accordingly. On the other hand, the overall, paddy cultivation accounted for 24.35 percent of the total net operated land in the study area.

The results indicate that marginal and small farmers depend more heavily on paddy cultivation than medium and large farmers. The higher proportion of land allocated to paddy among smaller categories highlights its importance as a primary source of livelihood.

Table 3 shows the category-wise cost of cultivation of paddy crop among the respondent farmers. The analysis of various cost components reveals noticeable differences in expenditure patterns across marginal, small, medium, and large farmers, reflecting variations in resource availability, input use, and farm management practices. The average total cost of cultivation Rs. 42,763 per acre, the medium farmers recording as the highest cultivation cost of Rs. 43,918 per acre, followed by small, large farmers and marginal farmers are Rs. 43,314, Rs. 42,944, and t Rs. 41,632 per acre respectively. The comparatively higher cultivation cost incurred by medium farmers indicates greater use of modern inputs and improved production practices aimed at maximizing productivity.

Land rent constituted one of the major components of cultivation cost across all farm categories. Marginal farmers incurred the highest expenditure on land rent at Rs. 8,000 noted as 19.22 percent of their total cultivation cost. Small farmers spent Rs. 7,500 accounting for 17.32 percent, while medium and large farmers each incurred Rs. 6,500 with 14.80 percent and 15.14 percent, respectively. On average, land rent amounted to Rs. 7,000 accounting for 16.37 percent of the total cultivation cost. The relatively higher share of land rent among marginal farmers indicates greater dependence on leased-in land for paddy cultivation.

Table – 3**Particulars of Category-wise Cost of Cultivation of Paddy Crop**

Cost Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Land Rent	8000 [19.22]	7500 [17.32]	6500 [14.80]	6500 [15.14]	7000 [16.37]
Tractors	5140 [12.35]	5800 [13.39]	6470 [14.73]	5250 [12.23]	5665 [13.25]
Seeds	1000 [2.40]	1000 [2.31]	1000 [2.28]	1000 [2.33]	1000 [2.34]
Manure	4000 [9.61]	4500 [10.39]	4800 [10.93]	4800 [11.18]	4525 [10.58]
Fertilizers	4492 [10.79]	5014 [11.58]	5018 [11.43]	5144 [11.98]	4916 [11.50]
Pesticides	1250 [3.00]	1400 [3.23]	2430 [5.53]	2000 [4.66]	1770 [4.14]
Irrigation	1500 [3.60]	1600 [3.69]	1450 [3.30]	2000 [4.66]	1637 [3.83]
Labour	11750 [28.22]	12000 [27.70]	11750 [26.75]	11750 [27.36]	11750 [27.48]
Harvesting	2500 [6.00]	2500 [5.77]	2500 [5.69]	2500 [5.82]	2500 [5.85]
Transport	2000 [4.80]	2000 [4.62]	2000 [4.55]	2000 [4.66]	2000 [4.68]
Total	41632 [100.0]	43314 [100.0]	43918 [100.0]	42944 [100.0]	42763 [100.0]

Source Field Study

Expenditure on tractor operations increased from Rs. 5,140 among marginal farmers to Rs. 6,470 among medium farmers before declining to Rs. 5,250 for large farmers. The corresponding cost shares ranged from 12.35 percent for marginal farmers to 14.73 percent for medium farmers. The overall average expenditure on tractor operations was Rs. 5,665 reported as 13.25 percent of the total cultivation cost. Higher mechanization among medium farmers suggests timely field preparation and efficient farm operations.

Seed cost remained uniform across all farm categories at Rs. 1,000 per acre. However, its proportional share in the total cultivation cost varied slightly because of differences in total expenditure, ranging from 2.28 percent for medium farmers to 2.40 percent for marginal farmers. The overall share of seed cost was 2.34 percent, indicating that seed constituted a relatively small but essential component of paddy cultivation.

The expenditure on manure showed a gradual increase with farm size. Marginal farmers spent Rs. 4,000 with 9.61 percent, small farmers Rs. 4,500 reported as 10.39 percent,

while medium and large farmers each spent Rs. 4,800 accounting for 10.93 percent and 11.18 percent, respectively. The average expenditure on manure was Rs. 4,525 constituted as 10.58 percent of the total cultivation cost. The higher expenditure among medium and large farmers suggests greater emphasis on maintaining soil fertility and crop productivity.

Fertilizer expenditure also increased with farm category. Marginal farmers spent Rs. 4,492 accounting for 10.79 percent of total cost, whereas large farmers incurred the highest expenditure of Rs. 5,144 reported as 11.98 percent. The average fertilizer cost was Rs. 4,916 constituting as 11.50 percent of the total cultivation cost. This indicates greater adoption of recommended nutrient management practices among relatively larger farmers.

A significant variation was observed in pesticide expenditure. Marginal farmers spent only Rs. 1,250 accounting for 3.00 percent of total cost, while medium farmers incurred the highest expenditure of Rs. 2,430 noted as 5.53 percent. Large farmers spent Rs. 2,000 representing for 4.66 percent, and small farmers spent Rs. 1,400 constituting 3.23 percent. The overall average expenditure on pesticides was Rs. 1,770 accounting for 4.14 percent. The higher expenditure among medium farmers reflects greater investment in plant protection measures to minimize crop losses and improve yields.

Irrigation cost varied moderately across farm categories. Marginal farmers spent Rs. 1,500 accounting for 3.60 percent of total cultivation cost, while large farmers incurred the highest irrigation expenditure of Rs. 2,000 equals to 4.66 percent. The average irrigation cost was Rs. 1,637 noted as 3.83 percent of the total cultivation cost. The higher irrigation expenditure among large farmers may be attributed to larger irrigated plots and greater dependence on mechanical irrigation systems.

Human labour emerged as the largest single cost component across all categories of farmers. Marginal farmers incurred Rs. 11,750 accounting for 28.22 percent of total cultivation cost, followed by small farmers with Rs. 12,000 representing for 27.70 percent. Medium and large farmers each spent Rs. 11,750, with 26.75 percent and 27.36 percent, respectively. On average, labour cost amounted to Rs. 11,750 constituted for 27.48 percent of the total cultivation cost. The consistently high share of labour expenditure highlights the labour-intensive nature of paddy cultivation despite the increasing use of mechanization.

Harvesting cost remained constant across all farm categories at Rs. 2,500 per acre. Its share in total cultivation cost varied only marginally from 5.69 percent among medium farmers to 6.00 percent among marginal farmers, with an overall average of 5.85 percent. Similarly, transport expenditure was uniform at Rs. 2,000 per acre across all categories, accounting for an average of 4.68 percent of the total cultivation cost. The uniformity of these costs indicates that harvesting and transportation charges were largely determined by prevailing market rates rather than farm size.

Overall, the analysis reveals that labour, land rent, tractor operations, fertilizers, and manure together constituted the major share of paddy cultivation cost across all farm categories. Labour alone accounted for more than one-fourth of the total cultivation cost, making it the most significant expenditure item, followed by land rent and tractor charges. Medium farmers incurred the highest overall cultivation cost due to greater investment in mechanization, fertilizers, manure, and plant protection chemicals, whereas marginal farmers spent relatively more on land rent because of their dependence on leased land. Large farmers recorded comparatively higher expenditure on irrigation and fertilizers, indicating better access to production resources. These variations in the composition and magnitude of cultivation costs are likely to influence productivity, profitability, and the economic efficiency of paddy cultivation among different categories of farmers. The findings demonstrate that the pattern of input utilization differs substantially across farm categories, providing a strong basis for examining the relationship between cost of cultivation and economic efficiency of paddy in the study area.

Table – 4**Category, Area and Yield Ranges- wise Distribution of Paddy Crop**

Cost Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Area in Acres	102 (28.49)	118 (32.96)	91 (25.42)	47 (13.13)	358 (100.0)
Total Yield	2310	2557	2265	1184	8316
Average Yield	22.6	21.7	24.9	25.2	23.2

Source: Field Study

Table 4 presents the category-wise distribution of area under paddy cultivation and yield among the respondent farmers. The total area cultivated under paddy was 358 acres. Small farmers cultivated the largest area with 118 acres accounting for 32.96 percent of the total paddy area, followed by marginal farmers with 102 acres accounting for 28.49 percent. Medium farmers cultivated 91 acres representing as 25.42 percent, while large farmers cultivated 47 acres constituted as 13.13 percent. The distribution indicates that although large farmers possessed larger operational holdings, a greater share of the total paddy area was cultivated by marginal and small farmers.

The total production of paddy from the sampled farmers was 8,316 quintals. Small farmers recorded the highest total yield of 2,557 quintals, followed by marginal farmers with 2,310 quintals and medium farmers with 2,265 quintals. Large farmers produced 1,184 quintals, mainly because they cultivated a comparatively smaller area under paddy. Thus, total production was influenced more by the extent of area cultivated than by farm category alone.

The average yield per acre showed a different pattern across the farm categories. Large farmers achieved the highest average yield of 25.2 quintals per acre, followed by medium farmers with 24.9 quintals per acre. Marginal farmers recorded an average yield of 22.6 quintals per acre, while small farmers obtained the lowest average yield of 21.7 quintals per acre. The overall average yield of paddy in the study area was 23.2 quintals per acre. The findings indicate that while marginal and small farmers contributed the largest share of the cultivated area and total production, medium and large farmers realized higher productivity per acre. This suggests that larger farms may benefit from better access to quality inputs, mechanization, improved crop management practices, and efficient resource utilization, which are important determinants of the cost of cultivation and economic efficiency of paddy cultivation.

Table – 5**Averages of Yield, Price and Income of Paddy: Category-wise**

Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Average Yield Per Acre in Qt	22.6	21.7	24.9	25.2	23.2
Price per Qt	2100	2100	2100	2100	2100
Average Income Per Acre in Rs.	47561	45501	52274	52889	48779

Source: Field Study

Table 5 presents the category-wise average yield, market price, and income per acre from paddy cultivation among the respondent farmers. These indicators provide a clear understanding of the economic performance of paddy cultivation across different farm categories.

The average yield per acre varied across the categories. Large farmers recorded the highest average yield of 25.2 quintals per acre, followed closely by medium farmers with 24.9 quintals per acre. Marginal farmers obtained an average yield of 22.6 quintals per acre, while small farmers recorded the lowest average yield of 21.7 quintals per acre. The overall average yield for the sampled farmers was 23.2 quintals per acre. The relatively higher productivity achieved by medium and large farmers may be attributed to better access to quality inputs, mechanization, efficient irrigation facilities, and improved crop management practices.

The market price of paddy remained uniform across all farm categories at Rs. 2,100 per quintal. Since all respondent farmers received the same selling price, variations in income were primarily influenced by differences in yield rather than price. This provides a fair basis for comparing the economic performance of different farm categories.

The average income per acre reflected the differences in productivity among the respondent farmers. Large farmers earned the highest average income of Rs. 52,889 per acre, followed by medium farmers with Rs. 52,274 per acre. Marginal farmers realized an average income of Rs. 47,561 per acre, whereas small farmers obtained the lowest average income of Rs. 45,501 per acre. The overall average income from paddy cultivation was Rs. 48,779 per acre. The findings indicate a positive relationship between yield and income across the farm categories. Although marginal and small farmers contributed a larger share of the area under paddy cultivation, medium and large farmers generated higher income per acre because of their superior productivity. Better resource availability, efficient input utilization, timely farm operations, and adoption of improved production technologies appear to have enhanced the economic performance of medium and large farms. These results suggest that improving productivity among marginal and small farmers through better access to modern inputs, extension services, and mechanization can enhance their income and overall economic efficiency in paddy cultivation.

Table – 6**Net Economic Efficiency of Paddy Per Acre in Rs : Category-wise**

Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Average Cost of Cultivation	41632	43314	43918	42944	42763
Average Income	47561	45501	52274	52889	48779
Average Net Income	5929	2187	8356	9945	6016

Source: Field Study

Table 6 presents the category-wise net economic efficiency of paddy cultivation measured in terms of average cost of cultivation, average income, and average net income per acre. The comparison of these indicators provides a clear understanding of the profitability and economic efficiency of paddy cultivation among different farm categories. The average cost of cultivation per acre varied across the respondent farmers. Medium farmers incurred the highest cultivation cost of Rs. 43,918 per acre, followed by small farmers with Rs. 43,314 per acre and large farmers with Rs. 42,944 per acre. Marginal farmers recorded the lowest cultivation cost of Rs. 41,632 per acre. The overall average cost of cultivation was Rs. 42,763 per acre. The relatively higher cultivation cost incurred by medium and large farmers reflects greater investment in quality inputs, mechanization, fertilizers, and improved crop management practices.

The average income per acre also differed among the farm categories. Large farmers realized the highest average income of Rs. 52,889 per acre, followed by medium farmers with Rs. 52,274 per acre. Marginal farmers earned an average income of Rs. 47,561 per acre, while small farmers recorded the lowest average income of Rs. 45,501 per acre. The overall average income from paddy cultivation was Rs. 48,779 per acre. The higher income earned

by medium and large farmers was primarily the result of higher productivity per acre rather than differences in market price.

Net income, which represents the difference between income and cost of cultivation, serves as an important indicator of economic efficiency. Large farmers achieved the highest average net income of Rs. 9,945 per acre, followed by medium farmers with Rs. 8,356 per acre. Marginal farmers realized a moderate net income of Rs. 5,929 per acre, whereas small farmers earned the lowest net income of only Rs. 2,187 per acre. The overall average net income was Rs. 6,016 per acre.

The analysis clearly indicates that economic efficiency improved with increasing farm size. Although medium and large farmers incurred relatively higher cultivation costs, they generated substantially higher incomes and net returns because of better yields and more efficient utilization of production resources. In contrast, small farmers experienced the lowest economic efficiency as their higher cultivation cost was not matched by a corresponding increase in income. Marginal farmers performed better than small farmers despite lower investment, indicating relatively effective cost management. Overall, the findings suggest that access to modern technology, efficient input utilization, and better farm management practices play a significant role in enhancing the economic efficiency of paddy cultivation. Strengthening these factors among marginal and small farmers would improve their profitability and contribute to more sustainable paddy production in the study area.

Table – 7

The Cost Benefit Ratios of Paddy Per: Category-wise

Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Cost-Benefit Ratio	1: 1.14	1: 1.05	1: 1.19	1: 1.23	1: 1.14
Net Cost-Benefit Ratio	0.14	0.05	0.19	0.23	0.14

Source: Field Study

Table 7 presents the category-wise cost-benefit ratio and net cost-benefit ratio of paddy cultivation, which indicates the economic viability and efficiency of paddy production among different farm categories. The cost-benefit ratio was calculated by comparing the total income generated from paddy cultivation with the total cost incurred for production.

The overall cost-benefit ratio of paddy cultivation was 1:1.14, indicating that an investment of one rupee in paddy cultivation generated Rs. 1.14 as returns. The results reveal variations in profitability among different categories of farmers. Large farmers recorded the highest cost-benefit ratio of 1:1.23, followed by medium farmers with 1:1.19. Marginal farmers achieved a cost-benefit ratio of 1:1.14, which was equal to the overall average, whereas small farmers recorded the lowest ratio of 1:1.05.

The net cost-benefit ratio further explains the additional returns obtained over the cost of cultivation. Large farmers achieved the highest net cost-benefit ratio of 0.23, followed by

medium farmers with 0.19. Marginal farmers recorded a net cost-benefit ratio of 0.14, while small farmers obtained the lowest ratio of 0.05. The overall net cost-benefit ratio was 0.14, indicating that paddy cultivation generated positive returns over the investment across all farm categories.

The analysis shows that paddy cultivation was economically profitable for all categories of farmers, but the level of profitability varied considerably. Large and medium farmers achieved higher economic efficiency due to better productivity, efficient resource management, and greater adoption of improved production practices. Although marginal farmers obtained moderate returns, small farmers experienced comparatively lower profitability due to higher cultivation costs relative to their income. The findings suggest that improving access to quality inputs, mechanization, and efficient production technologies among marginal and small farmers can enhance their cost efficiency and improve the overall economic performance of paddy cultivation in the study area.

Major Findings

The study on cost of cultivation and economic efficiency of paddy cultivation across different farm categories revealed several important findings. The sample consisted of 360 respondent farmers, among whom marginal farmers represented the highest proportion with 40.28 percent, followed by small farmers with 33.89 percent, medium farmers with 17.50 percent, and large farmers with 8.33 percent. This indicates the dominance of marginal and small farmers in the paddy cultivation system.

The total irrigated land operated by the respondents was 706 acres, while the total area under paddy cultivation was 358 acres. Small farmers contributed the largest share of paddy area with 32.96 percent, followed by marginal farmers with 28.49 percent. The average size of irrigated land and net operated land increased with farm size, indicating differences in resource availability among farm categories.

The average cost of cultivation of paddy was Rs. 42,763 per acre. Medium farmers recorded the highest cultivation cost of Rs. 43,918 per acre, followed by small farmers with Rs. 43,314 per acre. Labour was the major cost component, accounting for 27.48 percent of total cultivation cost, followed by land rent and tractor charges.

The average yield of paddy was 23.2 quintals per acre. Large farmers achieved the highest yield of 25.2 quintals per acre, followed by medium farmers with 24.9 quintals per acre. The average income from paddy cultivation was Rs. 48,779 per acre, with large farmers obtaining the highest income of Rs. 52,889 per acre.

The average net income from paddy cultivation was Rs. 6,016 per acre. Large farmers achieved the highest net income of Rs. 9,945 per acre, followed by medium farmers with Rs. 8,356 per acre. The overall cost-benefit ratio was 1:1.14, indicating that paddy

cultivation was economically viable. Large farmers recorded the highest cost-benefit ratio of 1:1.23, while small farmers recorded the lowest ratio of 1:1.05 per rupee of investment.

Conclusion

The study concludes that paddy cultivation remains an important agricultural activity among farmers of all categories, particularly among marginal and small farmers who constitute the majority of cultivators in the study area. However, variations were observed in the cost structure, productivity, income, and economic efficiency among different farm categories due to differences in landholding size, resource availability, and adoption of production technologies.

The results indicate that larger farmers achieved higher economic efficiency compared to smaller farmers. Although medium and large farmers incurred higher cultivation costs, they obtained better yields and higher income due to efficient utilization of inputs, greater access to mechanization, improved crop management practices, and timely application of production resources. In contrast, small farmers recorded comparatively lower profitability because their cultivation costs were relatively high in relation to their income. Labour emerged as the largest component of paddy cultivation cost, highlighting the labour-intensive nature of paddy farming. Rising input costs, particularly labour, fertilizers, and machinery charges, may affect the profitability of small and marginal farmers. The positive cost-benefit ratio across all farm categories indicates that paddy cultivation provides economic returns; however, the level of returns differs according to farm size and resource efficiency.

Improving the economic efficiency of marginal and small farmers requires better access to quality inputs, affordable credit, farm machinery services, technical guidance, and improved production technologies. Promotion of collective farming approaches, custom hiring services for machinery, and efficient resource management practices can help reduce cultivation costs and enhance productivity. In the Overall, strengthening the production capacity of smaller farmers while encouraging sustainable and efficient farming practices is essential for improving the profitability and long-term viability of paddy cultivation.

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