International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 10 Issue: 04 | April - 2026 SJIF Rating: 8.659 ISSN: 2582-3930

Cost Benefit Analysis of Paddy and Cotton Crops - An Empirical study in Telangana

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Abstract:

This study examines the cost of cultivation and cost–benefit analysis of paddy and cotton crops in Venkatraopet village of Mallapur Mandal, Telangana. The analysis is based on primary data collected from 45 farmers selected through systematic random sampling. The study evaluates land distribution, cropping pattern, cost components, yield levels, gross income, net income, and cost benefit ratios across marginal, small, medium, and large farm categories. Results reveal that cotton generates higher gross income per acre compared to paddy due to its higher market price. However, cotton cultivation involves significantly higher input costs, particularly labour, fertilizers, and pesticides, resulting in lower net returns. In contrast, paddy cultivation shows moderate costs with relatively higher and more stable net income. The cost benefit ratio of paddy is consistently higher than cotton across all farm categories. The study concludes that paddy cultivation is more economically viable and cost efficient than cotton in the study area.

Keywords: - Cost of Cultivation, cropping pattern Cost Benefit Ratio (CBR), Farm Size Categories, Net Returns.

Introduction:

Agriculture plays an important role in the global and Indian economy. Globally, agriculture contributes about 4.3 percent to GDP, but it provides employment to nearly 26.4 percent of the world's workforce. In developing countries, the share of agriculture in employment is much higher than its share in GDP. In many such countries, agriculture contributes between 4 and 25 percent to GDP, while more than half of the population depends on it directly or indirectly for livelihood. In India, agriculture has been a key sector since Independence. In 1950–51, agriculture contributed about 59 percent to the country's GDP. Over time, its share declined due to the growth of industry and services, and it is now around 17 percent. However, agriculture still provides employment to a large share of the population, especially in rural areas. It not only feeds more than 140 corers people in India but also supports exports to other countries. Agriculture also supports industrial development. Many industries such as textiles, sugar, edible oil, fertilizers, and pesticides depend on agricultural raw materials. There is a close relationship between agriculture, industry, and the service sector. A large part of industrial income in India comes from agro-based industries. Agricultural products like rice, sugar, tea, coffee, fruits, vegetables, dairy products, meat, and fish are exported, helping the country earn foreign exchange. The sector also generates revenue for both Central and State Governments through land taxes and other related charges. Transport services like railways and ports also earn income by carrying agricultural commodities.

Cropping Pattern:

Cropping pattern refers to the distribution of different crops grown in a region. Agriculture provides both food and non-food items. Crops are broadly divided into food crops and commercial crops. Food crops include paddy, wheat, coarse grains, and pulses. Commercial crops include oilseeds, cotton, sugarcane, tea, coffee, fruits, vegetables, flowers, cashew, and coconut. Among the food crops Paddy as the stable food to the majority of the population and Cotton as the important commercial crop all over the India.

Paddy:

Paddy (rice) is one of the most important cereal crops in the world. More than 50 percent of the global population depends on rice as a staple food. Around 165 million hectares of land worldwide are under paddy cultivation in more than 100 countries. Major rice-producing countries include China, India, Indonesia, Vietnam, and Thailand. In 2022–23, global paddy production was about 514.9 million tonnes, with a major share coming from these leading countries. In India, about 47.7 million hectares were under paddy cultivation in 2022–23, producing 135.54 million tonnes. The average yield was around 2.84 tonnes per hectare. Major paddy-producing states include Telangana, Tamil Nadu, Andhra Pradesh, Assam, and Kerala. Telangana has emerged as one of the leading states in paddy cultivation. In 2022–23, about 23.23 lakh hectares were under paddy in the state. The yield during the Kharif season was about 49.4 quintals per hectare and around 64.22 quintals per hectare in the Rabi season, which is higher than the national average. Districts such as Nalgonda, Suryapet, Nizamabad, Siddipet, Karimnagar, and Jagityal are major paddy-growing areas.

Cotton:

Cotton is an important commercial crop used mainly in the textile industry. It is also used in edible oil and other industries. Cotton stalks are used as cattle feed. More than 80 countries cultivate cotton worldwide, and millions of farmers depend on it. Globally, about 32.10 million hectares were under cotton cultivation in 2021–22, with production of around 118.4 million bales. Major producers include China, India, Brazil, and Australia. China ranks first in yield, while India's average yield is lower compared to global leaders. In India, cotton is a major commercial crop. Around 6 million farmers cultivate cotton, and about 40–50 million people are engaged in related activities such as processing and marketing. India contributes about 23 percent of global cotton production. The textile industry consumes around 60 percent of cotton produced in the country. Major cotton-producing states are Maharashtra, Gujarat, and Telangana. Telangana ranks among the top states in production. Districts like Nalgonda, Adilabad, Sangareddy, and Nagarkurnool are important cotton-growing regions.

Determinants of Cropping Pattern:

Cropping pattern is influenced by many factors. Climate, including rainfall and temperature, plays a major role. Soil type, fertility, and water-holding capacity also affect crop selection. Availability of irrigation encourages farmers to grow water-intensive crops like paddy and sugarcane. Landholding size and ownership influence crop choice. Large farmers often prefer commercial crops, while small and marginal farmers usually grow food crops due to lower risk and cost. Tenant farmers may prefer short-duration crops. Market conditions, previous season prices, and demand also affect cropping decisions. This is similar to the cobweb effect, where farmers adjust cropping based on past price trends. Availability of credit, modern inputs, pest control measures, and government policies also play an important role.

Cost of Cultivation in Indian Agriculture:

Cost of cultivation varies across regions and crops. It is generally calculated per acre or per hectare. It includes expenses such as land rent, land taxes, labour charges, use of animals or machinery, fertilizers, manure, pesticides, irrigation charges, interest on capital, and other miscellaneous expenses. Government agencies like the Commission for Agricultural Costs and Prices (CACP) and the Directorate of Economics and Statistics estimate different cost concepts to measure cultivation expenses. These estimates help in fixing support prices and understanding farm profitability. Overall, agriculture remains a vital sector in India. Though its share in GDP has declined, it continues to provide employment, food security, raw materials for industries, and export earnings for the country.

Review of Literature:

Several empirical studies have examined the economics of paddy and cotton cultivation in different regions of India. Netam O. K. et al. (2019) analysed paddy cultivation in Rajnandgaon district of Chhattisgarh using primary data. The study estimated a benefit–cost ratio of 1.67, indicating strong economic viability. Human labour and fertilizer accounted for a major portion of total costs, but gross returns were sufficient to generate satisfactory net income for farmers. Mathiyazhini M. et al. (2024) studied paddy cultivation in the Thamirabarani River Basin of Tamil Nadu. They reported a benefit–cost ratio of 1.62. The rental value of land and labour charges were the major cost components. Despite higher costs, stable productivity and consistent market demand ensured profitability. Singh S. P., along with co-authors (2017), examined paddy production in Auraiya district of Western Uttar Pradesh. The study found a benefit–cost ratio of 1.30, reflecting moderate profitability. The authors emphasized that efficient use of inputs is essential to improve returns. Baghel S. et al. (2025) conducted an economic analysis of paddy cultivation using different cost concepts such as Cost A, Cost B, and Cost C. Their findings showed positive net returns across all farm categories. However, profitability varied depending on farm size and management practices. In the case of cotton, Vinay S. K. et al. (2021) analysed cotton production in Haryana. The benefit–cost ratio ranged between 1.04 and 1.22, suggesting marginal but positive returns. High expenditure on pesticides and labour significantly reduced net income. Panda S. et al. (2022) evaluated the impact of Integrated Pest Management (IPM) in cotton cultivation in Rajasthan. The study compared conventional methods with IPM practices and found that IPM achieved a higher benefit–cost ratio, reaching up to 2.23. This demonstrates that improved technology adoption can substantially enhance profitability. Sri K. N. et al. (2024) examined paddy-based cropping systems in Nellore district of Andhra Pradesh. The results indicated that paddy–cotton cropping systems generated higher net returns compared to monocropping systems. Diversification improved overall cost efficiency and income stability. The Directorate of Economics and Statistics (1971) provided secondary data on the cost of cultivation of major crops in India. The data showed that paddy generally maintains a benefit–cost ratio above one in irrigated areas, while cotton profitability tends to fluctuate due to pest incidence, input costs, and market price variations.

The above mentioned studies mainly focus on estimating cost structures and benefit–cost ratios of paddy and cotton at district or regional levels. However, there is limited comparative analysis between paddy and cotton under uniform methodological frameworks. Most studies emphasize profitability but give less attention to long-term sustainability, risk factors, price volatility, and climate variability. Farm-level efficiency differences across socio-economic categories are also inadequately examined. Further, dynamic changes in input costs and market integration in recent years are not comprehensively analysed. Therefore, a micro-level, comparative, and time-sensitive study is needed to better understand cost efficiency and profitability patterns.

Methodology:

The database for the study comprises data collected from primary and secondary sources. The primary data is collected from the Venkataraopet of Mallapur Mandal in Jagitial district in Northeren Telangana of India. The village has cultivating the all the crops the total of 906 farmers are cultivating the different corps mainly Paddy and Cotton. The total 45 sample respondents have been selected through randomly from 906 and the ratio worked out as 20.03: 1, as such every 20^{th} farmer as the respondent for the study. While in the selection of 45 respondents kept in view of the farmers who cultivating the both the crops of paddy and cotton, because the objective of the study is to study the cost of cultivation and the cost benefit analysis of Cotton and Paddy. The selection procedure of the respondents as based on the total number of farmers and the adopted number of farmers (TNF/AF=RF = 906/45 = 20.13 around 20^{th}, every 20^{th} farmer is the respondent) this procedure has been adopted in the village for the selection of the respondents for the study.

Objectives of the Study:

1. To observe the factors of production factors of Cotton and Paddy.
2. To examine the Cost-Benefit analysis of Cotton and Paddy crops per acre of the respondent farmers.

Hypotheses of the Study:

1. There is a significant difference in factors of the production of Paddy and Cotton
2. The cost of cultivation and the net economic efficiency is negative in Paddy and Cotton crops.

Paid out Costs:

To estimate the cost of cultivation the scholar has been used the paid out cost method has been adopted, because every input applied by the farmers by paying the charges in various forms even in their own factors too calculating cost and finally they are including to the total cost of production the following factors are mainly observed for the study. The cost of cultivation factors are hired labour (human, animal and machinery), maintenance expenses on owned animals and machinery, expenses on material inputs such as seed (home grown and purchased), fertilizer, manure, (owned and purchased), pesticides and irrigation, depreciation on implements and farm buildings such as cattle sheds, machine sheds, storage sheds. land revenue as rent paid for leased-in land and other miscellaneous expenses also calculated for the cost of cultivation.

Venkatraopet:

Venkatraopet is a village in Mallapur Mandal, located 39 km from the district headquarters. The village covers a total area of 888 hectares. It is bordered by Korutla in the south, Metpalli in the north, Gorrepalli in the west, and Chinthaluru in the east. According to the 2011 Census, the village has 1,255 households with a total population of 4,714, including 2,286 males and 2,428 females. The sex ratio is 1,014 females per 1,000 males. Scheduled Castes constitute 9.1 percent and Scheduled Tribes 12.16 percent of the population. The overall literacy rate is 45.50 percent, which is lower than the state average. Male literacy is 54.77 percent, while female literacy is 36.78 percent. Among workers, 94.67 percent are main workers and 5.33 percent are marginal workers. There are 1,045 cultivators and 490 agricultural labourers. Out of 888 hectares of agricultural land, 612 hectares are irrigated and 276 hectares are un-irrigated. Irrigation sources include canals (103 ha), wells and tube-wells (320 ha), and tanks and lakes (189 ha). The village has two Anganwadi centres, one primary school, and one high school. There is no hospital; basic health services are provided by local practitioners. Drinking water is supplied through an overhead tank, Mission Bhagiratha, and bore-wells. Six Self-Help Groups (SHGs), one Village Organization (VO), and one PACS support savings and awareness of government schemes.

Table – 1 presents the category-wise distribution of respondents, total land owned, and the average size of landholdings under different farm categories, namely Marginal, Small, Medium, and Large farmers. The classification of farmers is based on the extent of operational landholding. Farmers possessing less than 2.5 acres of land are categorized as Marginal farmers. Those owning land between 2.6 and 5.0 acres are considered Small farmers. Farmers holding land between 5.1 and 10.0 acres are classified as Medium farmers**,** while those cultivating more than 10.0 acres are grouped under Large farmers. This categorization helps in understanding the structural distribution of land and analyzing variations in ownership patterns among different farm size groups.

Table – 1
Category-wise Land Distribution of Respondents Particulars (Land in Acres)

Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
No. Respondents & Percentage	22 48.9	12 26.7	8 17.8	3 6.7	45 100.0
Total Land & Percentage	48 24.5	52 26.5	54 27.6	42 21.4	196 100.0
Average Size of Land	2.2	4.3	6.8	14.0	4.4

Source: Field Study

Of the total 45 respondents a majority of 22 respondents constituted as 49.0 percent as the highest followed by small, medium and large categories are 12 respondents constituted as 26.7, medium farmers as 8 respondents equals to 17.8 percent and the 3 respondents are in large farmers category with 6.7 percent. The distribution of the respondents share is decreasing from Marginal to Large landholdings and the variations are very wide in the same village as observed from the data. The total 196 acres of land is cultivating by the 45 respondents in the sample village. Of the land, 54 acres constitutes 27.6 percent of land belongs to Medium Farmers as the highest followed by Small, Marginal and Large categories are 52 acres equals to 26.5 percent, 48 acres with 24.5 percent and 42 acres constitutes as 21.4 percent. The average landholdings are gradually ascending order from Marginal to Large categories, MF – 2.2, SF – 4.3, Med F – 6.8 and LF – 14.0 acres.

The distribution of respondents and the their respective landholdings not similar, as per the data about 49.0 of respondents possessing of 24.5 percent of land from Marginal category the gap is 24.5 percent of respondents are more than the land percent. In Small Farmers category the distribution is almost similar percent of respondents and percent of area. In Medium Farmers category about 18.0 percent of respondents possessing about 28.0 percent of land and the difference is about 10.0 of land share is more than the respondent share. Coming to the Large Farmers category only 6.7 percent of respondents cultivating the land share of 21.4 percent, here also the land share 14.7 percent is higher than the respondent share.

There is a huge gap in the distribution of respondents and its land distribution negative distribution in MF, Med F and LF categories of the study. LF and Med F categories possessing the higher the land shares than the proportion of respondents. And it reveres in case of MF category, while the SF category both the distributions similar. Thus, the higher the land categories of respondents have the more land share which is indicating the land concentration among the LF and Med F categories as identified by the data analysis.

Table – 2 provides the information about the category-wise land distribution under the major crops of Paddy and Cotton of the respondents in the sample village. Of the 196 acres 54 acres belongs to Med F category as the highest followed by SF, MF and LF categories are 52, 48 and 42 acres and its proportional shares are 26.5, 24.5 and 21.4 percent respectively. Of the land 196 acres, under paddy cultivation 126 acres and its equals to about 64.0 percent and the remaining 70 acres constitutes as 36.0 percent under Cotton cultivation. A major share (64.0 percent) 126 acres of land under paddy cultivation, of which 42 acres of land by the Med F category with 33.3 percent as the highest, then followed by SF category 32 acres with 25.4 percent, LF category 31 acres constitutes as 24.6 percent and the remaining 21 acres with 16.7 percent by the MF category. In Cotton cultivation of the 70 acres of land a major share of 27 acres with 38.6 percent belongs to MF category, followed by SF, Med F and LF category are 20 acres constitutes as 28.6, 12 acres with 17.1 percent and 11 acres with 17.7 percent are accordingly.

Table – 2
Category-wise Land Distribution under Paddy and Cotton (Land in Acres)

Crops	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Paddy	21 16.7	32 25.4	42 33.3	31 24.6	126 100.0
Cotton	27 38.6	20 28.6	12 17.1	11 15.7	70 100.0
Total Land	48 24.5	52 26.5	54 27.6	42 21.4	196 100.0

Source: Field Study

The majority of land under paddy by the higher landholdings of Med F and LF categories both together 73 acres and about 58.0 percent and in case of Cotton the smaller landholdings of MF and SF both have 47 acres and about 67.0 percent as the major share. Thus, the cropping pattern among the respondents not similar, smaller landholdings interesting to cultivate Cotton crop, while the larger holdings more favour to cultivate the Paddy crops.

Table –3 reveals the cost of cultivation particulars of paddy crop per acre of the respondent farmers. The cost of cultivation particulars are land rent, expenditure on tractors, seeds cost, manure cost, fertilizers, pesticides, irrigation, labour, harvesting, and transport have been workout. The total average cost is Rs. 42763/- per acre of paddy crop and it is Rs. 43918/- of Med F and relatively more and least is from MF category with Rs. 41632/- and the remaining categories of SF and LF are with Rs. 43314/- and Rs. 42994/- per acre respectively.

Operation-wise cost particulars, of average cost of cultivation of Rs. 42763/-, of which, labour cost is Rs. 11750 and it constitute is 27.48 percent is the highest than the rest of costs, the other costs are land rent, tractor, fertilizers, manure, harvesting, transport, pesticides, irrigation and seeds averages are Rs 7000/- (16.37), Rs. 5665 (13.25), Rs. 4916/- (11.500, Rs. 4525 (10.58), Rs. 2500 (5.85), Rs. 2000 (4.68) Rs. 1770 (4.14), Rs. 1637 (3.83) and Rs. 1000 (2.34) percent respectively in the overall study.

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

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	1600	1450	2000	**1637**

	[3.60]	[3.69]	[3.30]	[4.66]	**[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

The Med F category is relatively more cost of cultivation of Paddy with Rs. 43918/- per acre, of which labour cost is the highest with Rs. 11750/- (26.75) and the other operations are land rent, tractor, fertilizer, manure, harvesting, pesticides, transport, irrigation, and seeds average costs are Rs. 6500 (14.80), Rs. 6470 (14.73), Rs. 5018 (11.43), Rs. 4800 (10.93), Rs. 2430 (5.53), Rs. 2000 (4.55), Rs. 1450 (3.30), and Rs. 1000 (2.28) percent respectively. The average Paddy cost of cultivation is Rs. 43314/- per acre in SF category, of which, labour cost is Rs. 12000/- (27.70) percent as the highest followed by, Rs. 7500/-, (17.32), land rent, Rs. 5800 (13.39) tractors, Rs. 5014 (11.58) fertilizers, Rs. 4500 (10.39) on manure, Rs. 2500 (5.77) on harvesting, Rs. 2000 (4.62) on transport, Rs. 1600 (3.69) on irrigation, Rs. 1400 (3.23) on pesticides and seeds Rs. 1000 (2.31) percentage of expenditure for Paddy cultivation. In case of LF category is Rs. 42944/- is the average cost of cultivation on Paddy per acre. Of which, Rs. 11500 (27.36) on labour is the highest followed by land rent, tractor, fertilizers, manure and harvesting average expenditures are Rs. 6500 (15.14), Rs. 5250 (12.23), Rs. 5144 (11.98), Rs. (4800 (11.18) and Rs. 2500 (5.82) percent respectively and Rs 2000 (4.66) percent of average expenditures are similar on irrigation, transport and pesticides operations. The lowest cost of cultivation of paddy is from MF category is Rs. 41632/- of which, labour, rent, tractor, fertilizers, manure, harvest, transport, irrigation, pesticides and seed average costs are Rs. 11750 (28.22), Rs. 8000 (19.22), Rs. 5140 (12.35), Rs. 4492 (10.79), Rs. 4000 (9.61), Rs. 2500 (6.0), Rs. 2000 (2.80), Rs. 1500 (3.60) and Rs. 1000 (2.4) percent respectively. In all the landholdings the trends of cost of cultivation of paddy is similar direction from the operational costs of labour to seeds, but the some of the figures are differing one to other categories, but in the aspects of land rent, seeds, harvest, transport and even labour costs are similar.

Table – 4 reveals the cost of cultivation particulars of Cotton crop per acre in the study area. The total average cost is Rs. 68224/- per acre in the overall study and it is Rs. 71362/- of LF and it is relatively more and lowest is from SF category with Rs. 65014/- and the remaining categories Med F and MF are with Rs. 68732/- and Rs. 66544/- per acre respectively. The total average is Rs. 68224/-, of which, labour cost is the highest is Rs. 29500/- and it constitute as 43.24 percent than the rest of costs, the other costs are fertilizers, tractor, land rent, pesticides, fertilizers, cattle-based cultivation, manure, transport, seeds and irrigation averages expenditure are Rs 7242/-(10.62), Rs.7087 (10.39), Rs.5500/- (8.06), Rs 5300 (7.77), Rs. 5150 (7.55), Rs. 3225 (4.73), Rs. 2000 (2.93) Rs. 1620 (2.37) and Rs. 1600 (2.35) percent of average expenditures accordingly in that order in the overall study.

The highest cost of cultivation is from LF category it is Rs. 71362/- per acre, of which labour cost is the highest with Rs. 29500/- (43.24) and the other costs namely fertilizer - Rs. 7762/- (10.88), tractor – Rs. 7500/- (10.51), pesticides – Rs. 6500/- (9.11), cattle-based cultivation – Rs 5500 (7.71), land rent – Rs. 5000 (7.01), manure – Rs. 3000 (4.20), transport – Rs. 2000 (2.80), irrigation and seeds each Rs. 1800 (2.52) percent of average expenditures accordingly. The average cost of cultivation of Med F category is Rs. 68732/- per acre on Cotton, of which, Labour cost is Rs. 30500/- (44.38) percent as the highest and followed by fertilizers Rs. 7282/- (10.59), tractor Rs. 6800 (9.89), cattle-based cultivation Rs. 5600 (8.15), land rent Rs. 5500 (8.0), pesticides Rs. 4900 (7.13), manure Rs. 3200 (4.66), transport Rs. 2000 (2.91), irrigation Rs. 1500 (2.18) and seeds Rs. 1450 (2.11) percent of costs accordingly.

Table – 4
Particulars of Cost of Cultivation of Cotton Crop: Category-wise

Cost Particulars	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Land Rent	6500 [9.77]	5000 [7.69]	5500 [8.00]	5000 [7.01]	**5500 [8.06]**
Tractors	6800 [10.22]	7250 [11.15]	6800 [9.89]	7500 [10.51]	**7087 [10.39]**
Cattle Based Cultivation	5000 [7.51]	4500 [6.92]	5600 [8.15]	5500 [7.71]	**5150 [7.55]**
Seeds	1560 [2.34]	1670 [2.57]	1450 [2.11]	1800 [2.52]	**1620 [2.37]**
Irrigation	1500 [2.25]	1600 [2.46]	1500 [2.18]	1800 [2.52]	**1600 [2.35]**
Manure	3500 [5.26]	3200 [4.92]	3200 [4.66]	3000 [4.20]	**3225 [4.73]**
Fertilizers	6684 [10.04]	7244 [11.14]	7282 [10.59]	7762 [10.88]	**7242 [10.62]**
Pesticides	4500 [6.76]	5300 [8.15]	4900 [7.13]	6500 [9.11]	**5300 [7.77]**
Labour	28500 [42.83]	27250 [41.91]	30500 [44.38]	30500 [42.74]	**29500 [43.24]**
Transport	2000 [3.01]	2000 [3.08]	2000 [2.91]	2000 [2.80]	**2000 [2.93]**
Total	**66544 [100.0]**	**65014 [100.0]**	**68732 [100.0]**	**71362 [100.0]**	**68224 [100.0]**

Source Field Study

In case of MF category, Rs. 66544/- is the average cost of cultivation on Cotton per acre, of which, Rs. 28500 (42.83) on labour as the highest followed by tractor is Rs. 6800 (10.22), fertilizers Rs. 6684 (10.04), land rent Rs. 6500 (9.77), cattle-based cultivation Rs. 5000 (7.51), pesticides Rs. 4500 (6.76), manure Rs. 3500 (5.26), transport Rs. 2000 (3.01), seeds Rs. 1560 (2.34) and Rs. 1500 (2.25) percent on irrigation accordingly. The lowest cost of cultivation of Cotton has been reported from SF category with Rs. 65014/- of which, labour, tractor, fertilizers, pesticides, land rent, cattle-based cultivation, manure, transport, seeds and irrigation average costs are Rs. 27250 (41.91), Rs. 7250 (11.15), Rs. 7244 (11.14), Rs. 5300 (8.15), Rs. 5000 (7.69), Rs. 4500 (6.92), Rs. 3200 (4.92), Rs. 2000 (3.01) and Rs. 1670 (2.57) and Rs. 1600 (2.46) percent respectively.

The average cost of cultivation of cotton is relatively more in LF category and the lowest in SF category of the study, the variation in between LF to SF is about Rs. 6300 per acre. In LF category, the average costs are irrigation and pesticides are comparatively higher, the land rent, manure, and the transport shares are relatively lower than the rest of categories of the study. In Med F category the average cost of cattle-based cultivation is more and the costs of tractors, irrigation and pesticides are lower than the rest of categories. In SF category, transport, fertilizers, seed and tractors average cost percentages are more and labour and cattle-based cultivation are comparatively lower than the rest of categories of the study. In case of MF category, land rent and manure average cost percentages are more and the averages of pesticides and fertilizers are lower percentages than the remaining categories of the study.

In all the landholdings the cost of cultivation trends are similar direction from the costs of labour to seeds, but the figures are differing, the cost of cultivation on cotton as observed similarities in land rent, seeds, harvest, transport and even labour cost in the study.

Table – 5 depicts the category-wise average yield (quintals per acre) and average income of paddy and cotton crops. The average market price considered as ₹2,800 per quintal for paddy and ₹6,500 per quintal for cotton. In the case of Paddy, the average yield ranges from 21.67 quintals as the least per acre among Small Farmers to 25.19 quintals as the highest per acre among Large Farmers. Medium Farmers - 24.89 Qt and Marginal Farmers - 22.65 Qt per acre also show considerable productivity levels. Correspondingly, average income from Paddy increases with farm size. Large Farmers earn the highest average income of ₹70,532 per acre, followed by Medium Farmers - ₹69,692, Marginal Farmers - ₹63,420, and Small Farmers - ₹60,676 per acre. The overall average yield and income of paddy are 23.23 quintals and ₹65,044 per acre respectively.

Table – 5

Average Yield and Income of Paddy and Cotton Crop

Average Price 2800 for Paddy and 6500 for Cotton per Qt: Category-wise

Yield Ranges In Qt Per Acre	Marginal Farmers		Small Farmers		Medium Farmers		Large Farmers		Total	
	Average Yield	Average Income	Average Yield	Average Income	Average Yield	Average Income	Average Yield	Average Income	Average Yield	Average Income
Paddy	22.65	63420	21.67	60676	24.89	69692	25.19	70532	23.23	65044
Cotton	10.76	69940	11.4	74100	11.76	76440	11.33	73645	11.3	73450

Source: Field Study

This indicates a positive relationship between farm size and productivity in paddy cultivation. In contrast, Cotton shows relatively stable yield levels across categories, ranging between 10.76 and 11.76 quintals per acre. Medium Farmers record the highest yield - 11.76 Qt and income - ₹76,440, while Marginal Farmers show slightly lower yield 10.76 Qt but substantial income ₹69,940 per acre. The overall average yield and income of cotton are 11.3 quintals and ₹73,450 per acre respectively.

A comparison reveals that cotton generates higher per acre income than paddy despite lower yield, mainly due to its higher market price. Thus, cotton appears more remunerative, while paddy shows better productivity consistency across larger holdings.

Table – 6 shows the category and crop –wise average income, cost of cultivation, and net income per acre of paddy and cotton of the respondents. The average income from paddy ranges from ₹60,676 of Small Farmers to ₹70,532 of Large Farmers, with an overall average of ₹65,044 per acre. The cost of cultivation varies between ₹41,632 of Marginal Farmers and ₹43,918 of Medium Farmers, with an overall average cost of ₹42,763 per acre. After deducting costs, the net income from Paddy is comparatively substantial across all categories. Large Farmers earn the highest net income of ₹27,588 per acre, followed by Medium Farmers as ₹25,774, Marginal Farmers of ₹21,788, and Small Farmers of ₹17,362 per acre. The overall net income from paddy is ₹22,281 per acre. This indicates that paddy cultivation is relatively profitable and economically stable across farm sizes, with higher farm categories enjoying better returns due to higher yields and scale advantages.

Table – 6
Crop -wise Average Income, Cost of Cultivation and Net Income of Selected Crops: Category-wise Per acre

Name of Food Crops	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Average Income Per Acre					
Paddy	63420	60676	69692	70532	65044
Cotton	69940	74100	76440	73645	73450
Cost of Cultivation Per Acre					
Paddy	41632	43314	43918	42944	**42763**
Cotton	66544	65014	68732	71362	**68224**
Net Income Per Acre					
Paddy	21788	17362	25774	27588	22281
Cotton	3396	9086	7708	2283	5226

Source: Field Study

In the case of cotton, the average income per acre is higher than paddy, ranging from ₹69,940 of Marginal Farmers to ₹76,440 of Medium Farmers, with an overall average of ₹73,450. However, the cost of cultivation is also significantly higher, varying from ₹65,014 to ₹71,362 per acre, with an overall average of ₹68,224. Consequently, the net income from cotton is comparatively low. Medium Farmers earn ₹7,708 per acre, Small Farmers ₹9,086, Marginal Farmers ₹3,396, and Large Farmers only ₹2,283. The overall net income is ₹5,226 per acre. Although cotton generates higher gross income, its high cultivation cost drastically reduces profitability. In contrast, paddy provides moderate income with controlled costs, resulting in higher and more stable net returns. Thus, paddy appears more economically viable than cotton in the study area.

Table – 7
Crop-wise Cost Benefit Ratios of Paddy and Cotton

Name of Crop	Marginal Farmers	Net Ratio	Small Farmers	Net Ratio	Medium Farmers	Net Ratio	Large Farmers	Net Ratio	Total	Net Ratio
Paddy	1:1.53	0.53	1:1.40	0.40	1:1.59	0.59	1:1.64	0.64	1:1.52	**0.52**
Cotton	1: 1.05	0.05	1:1.14	0.14	1: 1.11	0.11	1:1.03	0.03	**1:1.07**	**0.07**

Source: Field Study

Table – 7 reveals the Cost Benefit Ratio (CBR) and Net Ratio of paddy and cotton across different farm categories. The CBR indicates the gross return per rupee invested, while the Net Ratio shows the net return per rupee of cost.

The CBR of paddy is highly favorable across all categories. Marginal Farmers record a CBR of 1:1.53 with a net ratio of 0.53, meaning that for every ₹1 invested, they earn ₹1.53 as gross return and ₹0.53 as net profit. Small Farmers show a CBR of 1:1.40 (net ratio 0.40), Medium Farmers 1:1.59 (0.59), and Large Farmers 1:1.64 (0.64). The overall CBR for paddy is 1:1.52 with a net ratio of 0.52 per rupee of cost. This clearly indicates that paddy cultivation is economically profitable for all farm sizes, with profitability increasing as farm size increases. Large and Medium Farmers enjoy better efficiency and higher returns per rupee invested. In

contrast, cotton shows comparatively lower profitability. Marginal Farmers have a CBR of 1:1.05 (net ratio 0.05), Small Farmers 1:1.14 (0.14), Medium Farmers 1:1.11 (0.11), and Large Farmers 1:1.03 (0.03). The overall CBR is 1:1.07 with a net ratio of 0.07 per rupee of cost on cotton. Although cotton yields a positive return (CBR above 1), the margin of profit is very low compared to paddy. High cultivation costs reduce net gains, especially for Marginal and Large Farmers.

The data clearly show that paddy is more economically viable and stable than cotton. Cotton cultivation involves higher cost of cultivation relatively paddy and the cotton as the higher risk and lower net returns per rupee invested. The main reason that it is more capital intensive crop mainly pesticides and other fertilizers and even in the harvesting point of view it is more expensive, because of manual labour only used for the harvesting of cotton while the paddy harvesting is only by machinery mode it is relatively lower cost of harvesting of paddy. As such the paddy ensures better cost efficiency and profitability across all farm categories.

Summary and Conclusion:

This empirical study examines the cost and profitability of paddy and cotton cultivation in Venkatraopet village of Telangana using primary data from 45 farmers. The study analyzes land distribution, cropping pattern, cost of cultivation, yield, income, and cost–benefit ratios across different farm categories. Results show that cotton generates higher gross income per acre, but its cost of cultivation is significantly higher. Paddy, though yielding moderate gross income, provides higher net income and better cost efficiency. The cost benefit ratio of paddy is consistently higher than cotton across all categories, indicating greater economic stability and profitability.

The study concludes that paddy cultivation is more economically viable and stable compared to cotton in the study area. Although cotton provides higher gross returns, its high input costs particularly labour, fertilizers, and pesticides substantially reduce net income. Paddy cultivation, on the other hand, maintains moderate production costs and generates higher net returns per rupee invested. The Cost Benefit Ratio clearly supports the economic superiority of paddy across all farm categories, especially among medium and large farmers. Cotton appears to be more capital-intensive and risk-prone due to price fluctuations and pest incidence. Therefore, from the perspective of profitability, cost efficiency, and economic sustainability, paddy cultivation performs better than cotton in the selected village of Telangana.

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