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A study on economic evaluation of paddy cultivation in the Gwalior District (M.P.)

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Abstract
Objective: To study the economic evaluation of paddy production
Methods: the present study has been conducted in Dabra block of Gwalior district M.P. to evaluate economic performance of wheat growers. Random sampling method was use to acquire 150 sample framers. Economic Evaluation of paddy farmers has been evaluated by calculating cost of cultivation and profitability concept along with B:C ratio.
Finding: After analysis of data it was found that average cost of cultivation of paddy production was observed ₹58514.45 /ha which was highest on small farm (₹63830.12/ha) and marginal farm (₹63830.12/ha) as compared to large farm (₹53860.43/ha) medium farm (₹54998.16/ha), and semi medium farmers (₹56031.35/ha). The highest gross income was found on large farm (Rs105283.56/ha) and lowest on semi medium farm (₹94747.50 /ha), the average net return was observed ₹41088.66 /ha which was highest on large farm ₹51423.13/ha and lowest on small farms (₹31804.85/ha). The average cost of production was observed 1322.18 ₹/qtl, which was highest on small farm 1473.97₹/qtl and marginal farm 1379.81₹/qtl and lowest on large farm 1185.83 ₹/qtl medium 1245.15 ₹/qtl and semi medium farm 1330.59 ₹/qtl. Based on aforesaid study average B: C ratio was observed 1:1.71 which was highest on large farm 1:1.95 and lowest on small 1:1.50 and marginal farm 1:1.61, indicated that large farmers is most economically efficient as compared to other categories farmers.

Key words: Cost of cultivation, cost of production, B:C ratio, net income, paddy

1. Introduction
India is an agriculture-rich country here most of the nation's peoples are farmers and engaged with farming, where most of the farmers is growing cereals, pulses, oilseed, etc. crop on their field, under the cereal crop paddy is widely grown by farmers as a food crop. In India paddy is cultivated under 43.79 million hectare with the production of 112 million tones and productivity 2578 Kg/ha. The considerable amount of paddy is getting cultivated in west Bengal, Punjab, Uttar Pradesh, Bihar and Madhya Pradesh. In Madhya Pradesh, paddy is grown mainly as a kharif crop on 2.04 million hectare with the production of 4.12 million tones and productivity 2026 kg/ha. In Gwalior district paddy is an important cereal crop cultivated on 44.5 thousand ha with the production of 160.4 thousand metric ton and play chief role in state's total paddy production. Dabra block of Gwalior district has a remarkable position in cultivation of paddy crops with the area of 46.31 thousand hectares. But in recent years the area under agriculture is getting reduced due to industrialization, urbanization while population of India rising rapidly therefore we need to increase production with advanced technology. Thus rice production not only makes the country food sufficient nation but also strengthen its agrarian economy [1]. On viewing the importance of the paddy crops in Indian economy, the present study is aimed to analyze a study on economic evaluation of paddy production in the Gwalior District M.P.

2. Material and Methods
The present study was confined to Gwalior district of Madhya Pradesh because this district has remarkable position under paddy crop in the gird zone, and also for the convenience of the researcher to get more accurate information.

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The multistage random sampling method was used to acquire sample farmers for the present study. Gwalior district has four blocks namely Bhitarwar, Dabra, Morar and Ghatigaon.

At the first stage of sampling, Dabra block was selected purposively, due to comprise maximum area under paddy cultivation (37710.03 ha.), at the second stage of sampling, a list of the paddy growing villages were prepared from selected block (Dabra) then 20 villages were selected randomly, and the third stage of sampling, a list of paddy growing farmers from each selected village was prepared then classified into five major categories on the basis of their land holding i.e. marginal (less than 1ha) small (1-2 ha), semi medium (2-4 ha), medium (4-10 ha) and large (10 ha or above) [2]. Then a sample of 30 farmers were selected in each category by simple random sampling technique under proportionate allocation from twenty villages treated as strata thus, 150 paddy growers were selected. With the help of given formula.

$$NI = \frac{N_i}{N} \times n$$

Where, n_i = i^{th} stratum sample size, N_i = i^{th} stratum size
N = Population size and n = Total sample size

After selection of respondent the primary data (2019-20, kharif and Rabi) regarding quantity of input used with their price, yield, gross income etc. were collected through pre-tested interview schedule by survey method. Each selected respondent were approached personally for collecting the relevant data.

2.1 Analytical Tools
2.1.1 Cost concepts
Standard farm management cost and returns concepts were used to estimate total cost incurred on paddy and wheat production. Detail estimation procedure is given below [3].

Cost A_1 = All actual expenses incurred in the crop production.
1. Value of hired human labour
2. Value of owned bullock labour
3. Value of hired bullock labour
4. Value of owned machine labour
5. Value of hired machine labour
6. Value of seed /seedling (farm produced or purchased)
7. Value of manures and fertilizers
8. Value of plant protection charges
9. Irrigation charges
10. Land revenue and taxes
11. Depreciation on farm building and implements
12. Interest on working capital

Cost A_2 = Cost A_1+rent paid for leased in land

Cost B_1 = Cost A_1+interest on value of owned capital asset (Excluding land)

Cost B_2 = Cost B_1 + rental value of owned land and rent paid for leased in land

Cost C_1 =Cost B_1+ imputed value of family labour

Cost C_2 = Cost B_2 + imputed value of family labour

Cost C_3 = Cost C_2 + 10% of cost C_2 as managerial cost

2.1.2 Cost of production
It is the ratio of total cost incurred on crops production and physical output obtained from the crop.

2.1.3 Cost of production $= \frac{\text{Total Cost}-\text{Value of by Product ₹/ha}}{\text{Main product(qtl/ha)}}$

2.1.4 Income measures
These are the return over different cost. Different income measures are derived using the cost concepts. These measures used in the benefit analysis of the present study are shown below.

1. **Farm business income** = Gross income - Cost A_1

2. **Farm investment income** = Farm business income – imputed value of family labour

3. **Net income** = Gross income - Total cost (Cost C_3)

4. **Family labour income** = Gross income - Cost B_2

B: C Ratio $= \frac{\text{Gross income(₹/ ha)}}{\text{Total Cost (₹/ha)}}$

3. Results and Discussion
The cost of cultivation is the most important economic tool to identify how much cost is incurred on different inputs and machinery used in the production process. The detail of per hectare cost on various factors along with different cost concepts like cost A_1 cost A_2 cost B_1 cost B_2, cost C_1, cost C_2, cost C_3 were studied and the results are present in table 1. For the better understanding result is also presented through the figure 1. The table reveals that the average total cost of paddy cultivation was found to be ₹58514.40 / ha. The total cost of cultivation among the categories was maximum observed on the small farm (₹63852.21/ha) and marginal farm (₹63830.12 /ha) [4] followed by semi-medium, medium, and large farm, ₹56031.35/ha, ₹54998.16/ha, and ₹53860.43 respectively. It implied that small and marginal farmers paid money for leasing land as compared to other farms. Operational cost (cost A_1) share maximum 69.33 per cent (₹40566.64/ha) in total cost of cultivation and remaining (30.67 per cent) cost together contributed by rent paid for lease in the land (4.13 per cent), interest on fixed capital (1.33) rental value of own land (11.62 per cent), the imputed value of family labour (4.50 per cent) and share of cost C_2 as managerial cost (9.09 per cent). Operational cost (cost A_1) across the categories were seen maximum on the marginal farm (₹42146.53/ha) and small farm (₹41306.74/ha) followed by semi-medium (₹40655.62/ha), medium (₹39848.92/ha) and large farm (₹38875 /ha). High cost on small and marginal farms due to the purchase costly input as compared to other farm. At overall farm among the component of cost A_1, fertilizer accounted maximum share ₹10519.42/ha (17.98 per cent of cost C_3), which was found to be maximum on a small farm (₹12289/ha) and marginal farm (₹10744.23) followed by large (₹10305.9/ha), medium (₹10258.8/ha), and semi-medium farm (₹8998.97/ha). After, cost of fertilizer it was observed that transplanting is the second most expensive input in the cultivation of paddy due to the high labour cost incurred in transplanting. At overall level, cost of transplanting was observed ₹8975.63/ha (15.34 per cent of cost C_3) which was highest on a semi-medium farm (₹10000/ha) followed by marginal (₹9410.42/ha), medium (₹8828.45/ha), small ((₹8803.11/ha) and large farm (₹7836.17/ha). Expenditures on

tractor uses were the third most expensive component of cost A_1, cost of a tractor was observed highest on a large farm (₹4211.72/ha) and lowest on marginal (₹3812.75/ha) farm which implied cost on tractor uses increase with the increasing size of the farm. The charges on human labour on an average farm were observed 3517.22 (6.01 per cent) which was the highest on the semi-medium farm (₹3769.45/ha), followed by small (₹3652/ha), marginal (₹3576.85/ha), medium (₹3295.15/ha), and large farm (₹3292.63/ha). Harvesting and threshing are the most important task performed by combiner (machinery), an average cost on harvesting and threshing was observed ₹3241.47/ha (5.62 per cent of C_3). The Maximum harvesting & threshing charge was born by semi-medium (₹3500/ha), and the lowest by the large farm (₹3103.37/ha). An average cost on seeds was observed ₹2000/ha (3.71of cost C_3) which was the highest on medium size of farm and lowest on the small size of the farm but not much variation seen in the cost of seed among categories due to all farmer in the study area use similar variety and seed rate in nursery preparation. The charges on irrigation were observed at overall farm-level ₹1076.35/ha (1.84 per cent) which was observed ₹1533.58/ha ₹1303.44/ha, ₹850/ha, ₹ 868.31/ha on marginal, small, semi-medium, medium, and large farm size respectively. The interest on working capital and land revenue state or village Panchayat tax was observed ₹2519.19/ha (4.31 per cent) and ₹250/ha (0.43 per cent) respectively at the overall farm. (Land revenue tax was observed the same for all sizes of the farm). Depreciation costs (repairs of farms implements and machinery) were charged at the rate of ₹480.25/ha in the marginal farm which was increased as the size of the farm increase from ₹538/ha (small), ₹767.25/ha (semi-medium), ₹889.53/ha (medium) and ₹929/ha on large size of farm. The cost A_2 (total of cost A_1 and rent paid for leas inland) accounted for ₹42982.96/ha (72.32 per cent of C_3) at the overall farm size. Cost A_1 and A_2 are the same in all sizes of farm except marginal (₹47707.11/ha) and small farm (₹47827/ha) which indicated that the leasing pattern of land was adopted only by marginal and small farmers due to the small size of landholding. Cost B_1, B_2, C_1, and C_2 were found ₹ 43760.05 /ha, ₹ 50560.05, ₹46394/ha, ₹53194.96 /ha respectively in paddy cultivation at overall farm size. Among categories cost B_1 B_2, C_1, and C_2 decrease with increasing size of farm except for marginal and small farm.

3.1 Profitability of paddy production
Profitability analysis is an economic indicator that plays a crucial role in analyzing the economic performance of farmers in the study area and helps to know about the economic sign of raising a crop. Table 2 represents economic indicators of rice cultivation on sampled farms. Detail regarding the value of the main product and by-product, gross income, cost of production net income, Farm business income, family labour income, farm investment income, and B: C ratio is given in table 2. It was noticed that the average yield of paddy was observed 44.26 qtl/ha at an overall farm level which found to be maximum on marginal farms (46.26 qtl/ha) followed by large farms (45.42 qtl/ha), medium (44.17 qtl/ha), small (43.32qtl/ha) and semi-medium farms (42.11 qtl/ha). The maximum yield on the marginal and large farm as compared to another farm because they adopt better cultural practices. Average, paddy farmers sold their produce at a price of ₹2250.35/qtl in the study area. the large farmers were found to be sold their produce at the maximum rate (₹2318/qtl) as compared to medium (₹2255.40/qtl), semi-medium

(₹2250/qt), marginal (₹2220.20 qtl/ha), and small farmers (₹2208.15 /qtl). This is indicated that large size farmer received more price per quintal due to they have the more technical knowledge and possessed marketing facilities such as storage, transport, type of variety, able to create more time utility in their product, whereas, small and marginal farmers received less price per quintal as compared to large farmers due to distress sell of the farm produce. The gross income, cost of cultivation, cost of production, net income, farm business income, family labour income, farm investment income, and the benefit-cost ratio at the overall farms level were found to be ₹99603.12/ha, ₹58514.45 /ha, ₹1322.18 /qtl,₹41088.66 /ha, ₹59036.47 /ha, ₹49043.06 /ha ₹56401.57 ha and 1:1.71 respectively from the cultivation of paddy. The gross income from paddy cultivation was found to be maximum on large farms (₹105283.56/ha) as compared to marginal (₹102706.4/ha), medium (₹99621.02/ha) small (₹95657.06 /ha) and semi-medium (₹94747.50 /ha). It is also observed from the data that net income from cultivation of paddy was found to be highest (51423.13/ha) on large farms as compared to another farm as well as farm business income ₹66408.12/ha, family labour incomes ₹58810.21/ha and farm investment income ₹63917/ha were also found to be highest on a large farm. The highest cost of production was observed under small (₹1473.97/qtl) followed by marginal (₹1379.81.19qtl), semi-medium ₹1330.59 /qtl, medium (₹1245.15/qtl) large (₹1185.83/qtl). The benefit-cost ratio was found to be highest on large farms [5] (1:1.95) as compared to medium farms (1:1.81) semi-medium (1:1.69) small (1.50) marginal (1:1.61).

3.2 Input-output ratio over the different cost of paddy crop
The B: C ratio gives estimates of return from the investment of one rupee in the production process. The B: C ratio for paddy production over different costs was worked out and the data on the same is presented in table 3. The data on the input-output ratio (B:C) indicates that the return from the investment of rupee one in the production of paddy gives more than one rupee return. On an average input-output ratio (B:C) over different cost *viz*. Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2, and Cost C_3 were found to be 1:2.46, 1:2.32, 1:2.28, 1:1.97, 1:2.15, 1:1.87 and 1:1.70 respectively. The input-output ratio over total costs (cost C_3) mentioned below was found to be highest on large farms (1:1.95) followed by medium farms (1:1.81) semi-medium (1:1.69) small (1.50) marginal (1:1.61). The estimated input-output ratio shows that the paddy production was profitable at the overall farm as well as among the categories.

3.3 Net Return over different costs
Table 4 indicates per hectare net return over different costs which were calculated by deducting the total cost from gross return. Based on various cost concepts on an average net return per ha over cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3 were recorded ₹59036.47, ₹56620.16, ₹43760, ₹49043.06, ₹53208, ₹46408.16 and ₹41088.6 respectively. The net return over cost A_1 per ha was found to be maximum on a large farm (₹66408.12) followed by marginal (₹60559.92), medium (₹59772.10), semi-medium (₹54091.88), and small ₹54350.35. Net return over cost A_2 per ha was found in order of ₹47829.35, ₹54091.88, ₹54999.34, ₹59772.10 and ₹66408.12 in small, semi-medium, marginal, medium, and large size farms respectively. Net return over cost B_1 per ha was found to be in the order of

₹39673.35, ₹40642.87, ₹41437.35, ₹48460.14 and ₹48586.57 in large, medium, semi-medium, marginal and small farms respectively. Whereas the net return over cost B_2 was found to be in the order of ₹40270.49/ha, ₹47446.32/ha, ₹46510.16/ha, ₹52178.15 /ha and ₹58810.21/ha in small, marginal, semi-medium, medium, and large farm respectively. In case of cost, C_1 net return was found to be maximum in a large farm (₹63119.54/ha) followed by medium (₹56422.70), semi-medium (₹50609.91), marginal (₹51479.07) and small farm size (₹44409.59) per ha. The same trends also follow in costs C_2 and C_3 in the study area. [6].

Table 1: Item wise cost of cultivation of paddy at the different size of farm (₹/ha)

Particulars	Marginal	Small	Semi Medium	Medium	Large	Average
Value of human labour	3576.85(5.60)	3652(5.71)	3769.45(6.72)	3295.15(5.9914)	3292.63(6.11)	3517.22(6.01)
Tractor charges	3812.75(5.97)	3200(5.01)	3981.59(7.10)	4408.41(8.01)	4211.72(7.82)	3922.89(6.70)
Transplanting	9410.42(14.74)	8803.11(13.78)	10000(17.84)	8828.45 (16.05)	7836.17(14.55)	8975.63(15.34)
Harvesting and threshing	3162(4.95)	3417.24(5.35)	3500(6.24)	3024.74(5.49)	3103.37(5.76)	3241.47(5.62)
Fertilizer and manure	10744.23(16.83)	12289.2(19.24)	8998.97(16.06)	10258.8(18.65)	10305.9(19.13)	10519.42(17.98)
Seeds	2039.31(3.19)	1918.18(3.00)	2000.31(3.57)	2024.45(3.68)	2021(3.75)	2000.65(3.42)
Irrigation charges	1533.58(2.40)	1303.44(2.04)	850(1.51)	863.35(1.56)	831.36(1.54)	1076.35(1.84)
Plant protection	4427.61(6.94)	3690.48(5.77)	3754.9(6.70)	3549.34(6.46)	3692.06(6.85)	3822.88(6.53)
Interest on working capital	2709.53(4.24)	2244.5(3.51)	2783.15(4.96)	2456.7(4.46)	2402.09(4.46)	2519.19(4.31)
Depreciation	480.25(0.75)	538.56(0.84)	767.25(1.36)	889.53(1.61)	929.14(1.73)	720.95(1.23)
Land revenue	250(0.39)	250(0.39)	250(0.44)	250(0.45)	250(0.46)	250.00(0.43)
Subtotal (Cost A_1)	42146.53(66.03)	41306.71(64.69)	40655.62(72.55)	39848.92(72.45)	38875.44(72.18)	40566.64(69.33)
Rent paid for lease in land	5560.58(8.71)	6521.00(10.21)	0.00	0.00	0.00	2416.32(4.33)
Subtotal (Cost A_2)	47707.11(74.74)	47827.71(74.90)	40655.62(72.55)	39848.92(72.45)	38875.44(72.18)	42982.96(73.46)
Interest on fixed capital	753.03(1.18)	758.86(1.18)	781.73(1.39)	793.95(1.44)	797.91(1.48)	777.09(1.33)
Subtotal (Cost B_1)	48460.14(75.92)	48586.57(76.09)	41437.35(73.95)	40642.87(73.89)	39673.35(73.66)	43760.05(74.79)
Rental value of own Land	6800(10.65)	6800(10.65)	6800(12.13)	6800(12.36)	6800(12.63)	6800.00(11.62)
Subtotal (Cost B_2)	55260.14(86.57)	55386.57(86.74)	48237.35(86.09)	47442.87(86.26)	46473.35(86.28)	50560.05(86.41)
Imputed value of family Labour	2767.25(4.34)	2660.90(4.16)	2700.25(4.81)	2555.45(4.64)	2490.674.62)	2634.90(4.50)
Subtotal (Cost C_1)	51227.39(80.26)	51247.47(80.25)	44137.60(78.77)	43198.32(78.54)	42164.02(78.28)	46394.96(79.29)
Cost C_2	58027.39(90.91)	58047.47(90.90)	50937.60(90.90)	49998.32(90.90)	48964.02(90.91)	53194.96(90.91)
(Cost C_3) C_2+ 10% of C_2	63830.12(100.00)	63852.21(100.00)	56031.35(100.00)	54998.16(100.00)	53860.43(100.00)	58514.45(100.00)

Source: Primary data (2019-2020), Figure in parentheses shows % of cost C_3

Table 2: Profitability of paddy production at the different size farms

Particulars	Size of farms					
	Marginal	Small	Semi Medium	Medium	Large	Overall
Average yield (qtl/ha)	46.26	43.32	42.11	44.17	45.42	44.26
Price of main Product (₹/qtl)	2220.20	2208.15	2250.00	2255.40	2318.00	2250.35
Value of main product(₹ /ha)	102706.45	95657.06	94747.50	99621.02	105283.56	99603.12
Production of by Product (qtl/ha)	-	-	-	-	-	-
Price ₹ /qtl	00	0.00	0.00	0.00	0.00	0.00
Value of by product ₹/ha	0.00	0.00	0.00	0.00	0.00	0.00
Gross income ₹/ ha	102706.45	95657.06	94747.50	99621.02	105283.56	99603.12
Total cost (cost c_3) ₹/ ha	63830.12	63852.21	56031.35	54998.16	53860.43	58514.45
Net Income ₹/ha	38876.33	31804.85	38716.15	44622.86	51423.13	41088.66
Cost of production ₹/qtl at cost C_3	1379.81	1473.97	1330.59	1245.15	1185.83	1322.18
Farm business income₹ /ha	60559.92	54350.35	54091.88	59772.10	66408.12	59036.47
Family labour income ₹/ha	47446.32	40270.49	46510.16	52178.15	58810.21	49043.06
Farm investment income ₹/ha	57792.67	51689.45	51391.63	57216.65	63917.45	56401.57
B:C ratio at cost C_3	1:1.61	1:1.50	1:1.69	1:1.81	1:1.95	1:1.71

Note: * There is not any economical byproduct generated from paddy production in the study because combiner is used for harvesting of paddy crop hence the value of byproduct is zero.

Table 3: Input-output ratio (B: C) over different costs in paddy production

Particulars	Marginal	Small	Semi Medium	Medium	Large	Average
B:C ratio over Cost A_1	2.44	2.32	2.33	2.50	2.71	2.46
B:C ratio over Cost A_2	2.15	2.00	2.33	2.50	2.71	2.32
B:C ratio over Cost B_1	2.12	1.97	2.29	2.45	2.65	2.28
B:C ratio over Cost B_2	1.86	1.73	1.96	2.10	2.27	1.97
B:C ratio over Cost C_1	2.00	1.87	2.15	2.31	2.50	2.15
B:C ratio over Cost C_2	1.77	1.65	1.86	1.99	2.15	1.87
B:C ratio over Cost C_3	1.61	1.50	1.69	1.81	1.95	1.71

Source: (Field survey-Primary data 2019-20)

Table 4: Net returns over different cost in paddy production (₹/ha)

| Size of farm	Marginal	Small	Semi Medium	Medium	Large	Average
Net return over Cost A_1	60559.92	54350.35	54091.88	59772.10	66408.12	59036.47
Net return over cost A_2	54999.34	47829.35	54091.88	59772.10	66408.12	56620.16
Net return over cost B_1	48460.14	48586.57	41437.35	40642.87	39673.35	43760.05
Net return over cost B_2	47446.32	40270.49	46510.16	52178.15	58810.21	49043.06
Net return over cost C_1	51479.07	44409.59	50609.91	56422.70	63119.54	53208.16
Net return over cost C_2	44679.07	37609.59	43809.91	49622.70	56319.54	46408.16
Net return over cost C_3	38876.33	31804.85	38716.15	44622.86	51423.13	41088.66
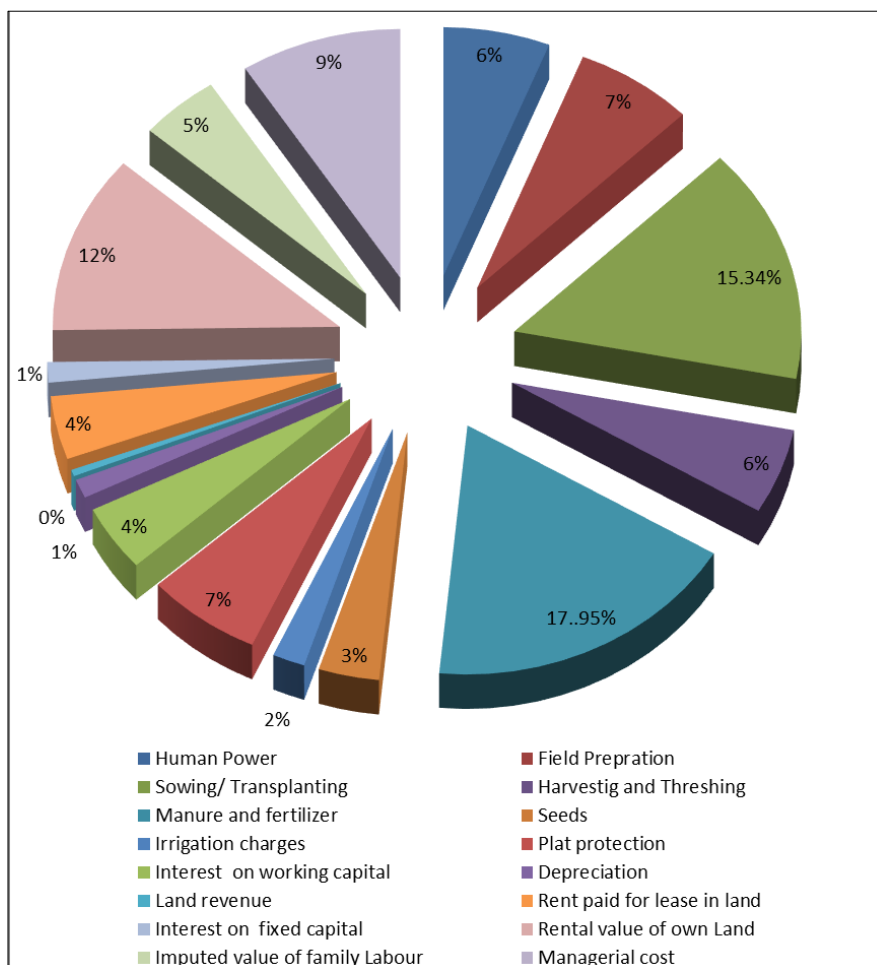
Fig 1: Input wise share of cost in the total cost of cultivation of paddy

4. Conclusions

It is concluded from aforesaid study that operational cost under paddy cultivation was observed ₹40566.64/ha which shares 69.33% cost of the total cost and reaming 30.67% cost together shared by rent paid for lease in the land (4.13%), interest on fixed capital (1.33%) rental value of own land (11.62%), the imputed value of family labour (4.50%) and 10 per cent interest on cost C_2 (9.09%). Rental value of land highest share among fixed cost. Among the cost A_1, cost on fertilizer accounted maximum share (17.98% of cost C_3), followed by transplanting 15.34%, and seed 3.42%. The total cost of cultivation among the categories was observed maximum on the small farm (₹63852.21/ha) and marginal farm (₹63830.12 /ha) followed by semi-medium, medium, and large farm, ₹56031.35/ha, ₹54998.16/ha and ₹53860.43 respectively. The average yield was observed 44.26 qtl/ha at an overall farm which found to be maximum on marginal farms (46.26 qtl/ha) followed by large farms (45.42 qtl/ha), medium (44.17 qtl/ha), small (43.32 qtl/ha) and semi-medium farms (42.11 qtl/ha). Average, paddy farmers sold their produce at a price of ₹2250.35/qtl in the study area, the large farmers were found to be sold their produce at the maximum rate (₹2318/qtl) as compared to medium (₹2255.40/qtl), semi-

medium (₹2250/qt), marginal (₹2220.20 qtl/ha), and small farmers (₹2208.15 /qtl). The gross income from paddy cultivation was found to be maximum on large farms (₹105283.56/ha) as compared to marginal (₹102706.4/ha), medium (₹99621.02/ha) small (₹95657.06 /ha), and semi-medium (₹94747.50 /ha). Net income from cultivation of paddy was found to be highest (51423.13/ha) on large farms as compared to other farm as well as farm business income ₹66408.12/ha, family labour incomes ₹58810.21/ha and farm investment income ₹63917/ha were also found to be highest on a large farm. Hence large farmers, semi medium, and medium farmers found more economically efficient as compared to marginal farmers and small farmers due to received per unit maximum price of their produce, less per quintal cost of production and high B:C ratio.

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