



Cost of Cultivation of Groundnut in Mahasamund and Raigarh District of Chhattisgarh

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study is to examine Cost of Cultivation of Groundnut in Mahasamund and Raigarh District of Chhattisgarh. The study was undertaken by taking 145 sample farmers during the year 2020-21. Interview schedule and survey method was used to collect information from sample area. The objective were achieving by using cost concepts and income measures. The cost of cultivation of groundnut was observed highest in case of large farms and lowest in case of marginal farms. The overall cost of cultivation was Rs. 39790.78 per hectare. The overall cost of production was Rs. 2731.18 per quintal. Gross return from groundnut was found to be Rs. 72461.13 per hectare. The net return of overall farmers was observed Rs. 32670.35 per hectare. The input-output ratio was highest in case of marginal farmer 1:1.88 and lowest in case of large farmer 1:1.76. To increase the yield level, there is need to increase adoption of recommended technologies like use of HYV and hybrid varieties, fertilizers, plant protection and other technologies given by the Universities for increasing the groundnut productivity.

Keywords: Cost and Return; input-output ratio; gross income; net return; HYV; fertilizer; hybrid variety; productivity.

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1. INTRODUCTION

Oilseed crop have been the backbone of several agricultural economies from antiquity and play a prominent role in agricultural industries and trade throughout the world. India is fortunate in having a variety of oilseed crops grown in its distinctive rich agro climatic zones. India ranks fifth in the world vegetable oil economy, next to USA, China, Brazil and Argentina. Oilseed crops accounts for 13% of gross cropped area, 3% of gross national product, 10% of total value of output from agricultural crops and 6.0% of value of output from agriculture and allied sector. The per capita availability of edible oils had increased from 3.5 kg/person/year in 1970-71 to 19.30 kg in 2017 -18 (Department of Sugar and Vegetable Oils; DG, CI and S, Dept of Commerce, Kolkata). The vegetable oil consumption India is continuously rising and has sharply increased in the couple of years touching around 13.8 kg/head/year. States ranking of oilseeds in 2019-20 are Madhya Pradesh (6244 thousand metric tons), Rajasthan (5711 thousand metric tons) Gujarat (4102 thousand metric tons) and Maharashtra (2375 thousand metric tons) [1]. During the financial year 2021 over 36 million metric tons of oilseeds were produced in the south Asian country of India. Groundnut is a leguminous plant that is widely cultivated in the tropics and sub-tropic. It is valued for its high-oil edible seeds and as such it is the fourth most important source of edible oil and a third most important source of vegetable protein in the world. Groundnut is not only an important oilseed crop of India but also an important agricultural export commodity. Globally Groundnut cover 295 lakh hectares with the production of 487 lakh tones with the productivity of 1647 kg hectare [2]. With annual all-season coverage of 55.6 lakh hectare, globally, India ranks first in Groundnut acreage and is the second largest producer of Groundnut in the world with 101 lakh tones with a productivity of 1816 kg per hectare in 2020-21 [3]. India is among the top three producing countries of Groundnut in the world. It second next to China (37 percent contributing to the world Groundnut production). Nearly 15 percent of Groundnut production is contributed by India to the world production during 2018. Nigeria ranks third in world Groundnut production with percent contributing. Groundnut is a major oilseed crop contributing around 37 percent of the total oilseeds production in the country during 2020-21. The area under groundnut constitutes approximately 3.3 percent of the net sown area in India. In India Groundnut is mainly grown in

five states, Andhra Pradesh, Gujarat, Tamil Nadu, Karnataka and Maharashtra and together they account for more than 90 percent of the crop's total area. Gujarat was the largest producer contributing 25 percent of the total production followed by Tamil Nadu (22.48%), Andhra Pradesh (18.81%), Karnataka (12.64%) and Maharashtra (10.09%) during 2006-07. Groundnut can be cultivated in both rabi and kharif season in Chhattisgarh. Total area of groundnut in Chhattisgarh is 67.7 thousand ha⁻¹ with the production of 70.2 thousand tones and the productivity of 103 kg ha⁻¹ respectively.

Objective: To work out the cost and returns of groundnut.

2. REVIEW OF LITERATURE

Painkra et al. [4] studied that the economics of groundnut production is more profitable in small size farms as compared to medium size farms and large size farms. The average cost of cultivation is worked out as Rs. 29673.10 per hectare which ranges from about Rs. 30305.18 per hectare at small farms, Rs. 29329.60 medium farms, Rs. 28924.20 per hectare at large farms. The per quintal cost of production varied from Rs. 1900.45 at large farms, Rs. 2014.39 at medium farms to Rs. 2191.26 at small farms.

Sunandini G. P. and Devi I. S. [5] reported the cost of cultivation of groundnut was found to be Rs. 55142.26/ha. Among the operational costs, labour cost accounted to a major share of 60 % indictaing the labour intensive nature of groundnut cultivation.

Abubakari et al. [6] examined the cost benefit ratio of 0.30 and gross margin of GH 22, 143.4 indicating that groundnut production in the study area is profitable. Profit was estimated at GHS 42, 584.3. Cost of harvesting positively influenced profitable however measures are required to increase profitability since groundnut is an important cash/food security crop for smallholders.

Rout et al. [7] concluded that the gross income per hectare in cultivation of groundnut was Rs. 89712.17. the net income was worked Rs. 43086.06. The study of constraints in production of the groundnut the timely not available of labour, lack of storage facilities at farm level, weeding problem.

Choudhary et al. [8] studied the costs and returns structure in Porbandar district of Gujarat. The

study was based on the primary data of 45 groundnut cultivators. The per hectare cost of cultivation for kharif groundnut was ` 50,434.33. Total benefit cost ratio of kharif groundnut was 1.12.

3. MATERIALS AND METHODS

The study was finite to Mahasamund and Raigarh district of Chhattisgarh state. Raigarh district has nine block, out of 9 block Dharamjaigarh block and Mahasamund district has 5 block, out of 5 block Saraipali block was selected purposively because it cover maximum area. The list of groundnut grower villages was obtained from the office of Deputy Director of Agriculture, Mahasamund and Raigarh for the year 2020-21. The percentage proportionate sampling method was used. There were 145 groundnut growers, which were 70 from Saraipali and 75 from Dharamjaigarh comprised of 52, 48, 31 and 20 groundnut growers of marginal, small, medium and large size categories, respectively. The primary data were collected from sample farmers on all the relevant aspects by using well structured interview schedule to fulfill the objectives of the study. Costs of cultivation of groundnut in the sampled farms were analyzed and examined using cost concepts and income measures of the groundnut growing farmers.

Cost concepts and Income measures:-

Cost A1: Value of hired human labour ,Value of owned bullock labour ,Value of hired bullock labour Value of owned machinery ,Hired machinery charges ,Value of fertilizers Value of manures (owned and purchased), Value of seed (farm produced and purchased), Value of plant protection chemicals, Irrigation charges , Canal water charges, Land revenue and other taxes ,Depreciation on farm implements and farm buildings , Interest on working capital

Cost A2: Cost A1 + Rent paid for leased in land

Cost B1: Cost A1 + interest on value on fixed capital

Cost B2: Cost A2 + Rental value of owned land &rent paid for leased in land

Cost C1: Cost B1 +Imputed value of family labour

Cost C2: Cost B2 + Imputed value of family labour

Cost C3: Cost C2 + 10% of Cost C2 on account of managerial function performed by farmer

Income measures:

Gross income = (Quantity of main product* price of main product)+ (Quantity of by product* price of by product)

Net income = Gross income – Cost C

Family labour income = Gross income – Cost B

Farm business income = Gross income – Cost A1

Farm investment income = Farm business income – Imputed value of family labour

Input-output ratio = Gross income/Cost of cultivation

4. RESULTS AND DISCUSSION

4.1 Cost of Cultivation of Groundnut

The present section deals with the variable cost and fixed cost for cultivation of groundnut in the study area. Table 1 represent the total cost of cultivation for Mahasamund and Raigarh district respectively. These are clearly shows that input cost for cultivation of groundnut per hectare which is highest in case of large farms and lowest in case of marginal farms. It is due to fact that large farmers could incur more income expenditure on modern farm inputs like quality seed, fertilizer, plant protection, chemical and hired labour etc. Table 1reveals that overall cost of input used for groundnut was found to be Rs. 7242.90 (18.20 percent). This varies from Rs. 6596.39 per hectare (23.30 percent) at marginal farmer, Rs.7365.34 per hectare (18.63 percent) at small farmer, Rs. 7621.44 per hectare (18.04 percent) at medium farmer and Rs. 8079.98 per hectare (18.05 percent) at large farmer. The cost liest item of input for cultivation of groundnut crop was human labour which was 31.66 percent to total. The overall share of human labour cost was noticed to be Rs. 12599.43 per hectare. Family labour cost was Rs. 6295.96 per hectare (17. 20 percent) at marginal farms, Rs. 5906.45 per hectare (14.94 percent) at small farms, Rs. 5020.13 per hectare (11.88 percent) at medium farms and Rs. 3243.85 per hectare (7.24 percent) at large farms. Hired labour cost was Rs. 4581.08 per hectare (12.52 percent) at marginal farm, Rs. 6608.08 per hectare (16.71 percent) at small farms, Rs. 9642.44 per hectare (22.82 percent) at medium farm and Rs. 10814.23 per hectare (24.15 percent) at large farms. Table shows that share of total human labour was the maximum to total input cost for groundnut followed by seed cost (5.70 percent). The overall machine labour (13.66 percent), manure and fertilizer was (6.74 percent), plant

protection chemical was (3.32 percent) cost observed. It was observed that the groundnut cultivators had not applied the recommended dose of fertilizers there by resulting in reduce yield of groundnut. The cost of cultivation of groundnut was found to be increase with increase in size of holding from Rs.36604.37 on marginal to Rs. 44774.45 on large sized farms this finding observed the Khorne et al. [9].

4.2 Cost on the Basis of Cost Concept at Sample Households

The cost and return on the basis of cost concept in the production of groundnut is presented in

Table 2. On an overall Cost-A1, Cost-A2, Cost-B1, Cost-B2, Cost-C1, Cost-C2, Cost C3 and Cost A2+FL as Rs. 20048.66 per hectare, Rs. 20048.66 per hectare, Rs. 20201.39 per hectare, Rs. 34301.39 per hectare, Rs. 27721.81 per hectare, Rs. 39790.78 per hectare, Rs. 43769.86 per hectare and Rs. 25538.05 per hectare for groundnut respectively, on the sample farms. All costs were comparatively higher at large farms followed by marginal, small and medium farms. It shows that capital spending on production increased with increase in the farm size. This was because the large famers purchased more inputs in each and every season which were required for production of groundnut.

Table 1 Cost of cultivation of groundnut (Rs/ha)

S.N.	Particular	Farm Size				
		Marginal (52)	Small (42)	Medium (31)	Large (20)	Overall (145)
Variable cost						
1	Family Human labour	6295.96 (17.20)	5906.45 (14.94)	5020.13 (11.88)	3243.85 (7.24)	5489.39 (13.80)
2	Hired Human labour	4581.08 (12.52)	6608.08 (16.71)	9642.44 (22.82)	10814.23 (24.15)	7110.04 (17.87)
	Total Human labour	10877.04 (29.72)	12514.53 (31.65)	14662.57 (34.70)	14058.08 (31.40)	12599.43 (31.66)
3	Machine power	4729.79 (12.92)	5129.79 (12.97)	5423.69 (12.84)	7930.55 (17.71)	5435.49 (13.66)
	Total labour cost	15606.83 (42.64)	17644.32 (44.62)	20086.26 (47.54)	21988.63 (49.11)	18034.92 (45.32)
4	Seed	2157.53 (5.89)	2287.47 (5.78)	2339.59 (5.54)	2413.50 (5.39)	2269.40 (5.70)
5	Manure + fertilizer	2332.58 (6.37)	2837.12 (7.17)	2892.48 (6.85)	2925.00 (6.53)	2680.14 (6.74)
7	Plant protection	1252.31 (8.70)	1278.84 (8.80)	1232.69 (9.10)	1585 (3.54)	1321.14 (3.32)
8	Interest on working capital	853.97 (2.33)	961.91 (2.43)	1065.68 (2.52)	1156.48 (2.58)	972.22 (2.44)
	Sub total	6596.39 (23.30)	7365.34 (18.63)	7621.44 (18.04)	8079.98 (18.05)	7242.90 (18.20)
	Total variable cost	22203.22 (65.93)	25009.66 (63.25)	27707.70 (65.57)	30068.61 (67.16)	25277.82 (63.53)
Fixed cost						
1	Land Revenue	10 (0.03)	10 (0.03)	10 (0.02)	10 (0.02)	10 (0.03)
2	Depreciation on implement	195 (0.53)	256.49 (0.65)	240 (0.57)	396.53 (0.89)	250.23 (0.63)
3	Rental value of owned land	14000 (38.25)	14000 (35.40)	14000 (33.13)	14000 (31.27)	14000 (35.18)
4	Interest on fixed capital	196.15 (0.54)	267.32 (0.68)	297.81 (0.70)	299.31 (0.67)	252.73 (0.64)
	Sub-total	14401.15 (39.34)	14533.81 (36.75)	14547.81 (34.43)	14705.84 (32.84)	14512.96 (36.47)
	Total cost (A+B)	36604.37 (100)	39543.47 (100)	42255.51 (100)	44774.45 (100)	39790.78 (100)

Note: Figures in the parentheses indicate the percentages to the total cost of cultivation

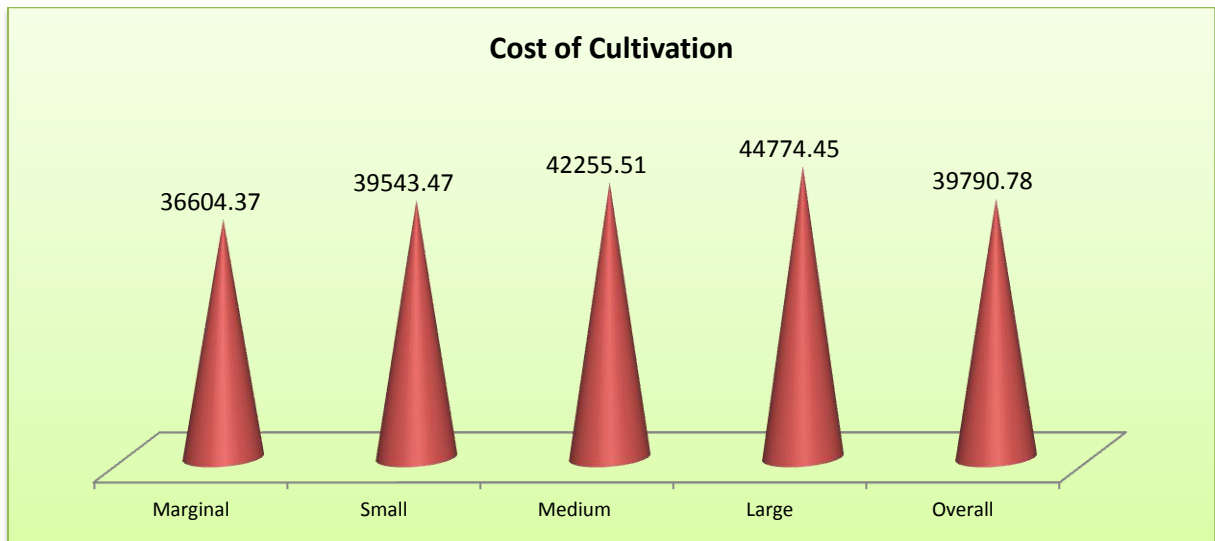


Fig. 1. Cost of cultivation of groundnut at sample farmers (Rs./ha)

Table 2. Break-up of cost, cost concept wise cost in groundnut at the sample farm (Rs/ha)

S.N.	Cost	Marginal	Small	Medium	Large	Overall
Break-up cost						
1	Cost A1	16112.26	19369.70	22937.57	27231.29	20048.66
2	Cost A2	16112.26	19369.70	22937.57	27231.29	20048.66
3	Cost B1	16308.41	19637.02	23235.38	27530.60	20201.39
4	Cost B2	30308.41	33637.02	37235.38	41530.60	34301.39
5	Cost C1	22604.37	25543.47	28255.51	44774.45	27721.81
6	Cost C2	36604.37	39543.47	42255.51	44774.45	39790.78
7	Cost C3	40264.81	43497.82	46481.06	49251.89	43769.86
8	A2+FL	22408.22	25276.15	27957.70	30475.14	25538.05

4.3 Yield, Cost and Return of Groundnut at Sampled Farms

The data of farm measure is presented in Table 3. the overall production was worked out as 14.68 quintal per hectare and by product was 9 quintal per hectare which ranges from about 13.70 quintal per hectare and by product 8.2 quintal per hectare at marginal farms to 15.75 quintal per hectare and by product 8.9 quintal per hectare at large farms. The overall cost of cultivation for groundnut was observed to be 39790.78 per hectare. The overall gross income was observed as Rs. 72461.13 per hectare In the study area which ranges from Rs. 68910 per hectare at marginal farms to Rs. 78972.50 per hectare at large farms. The overall cost of production was found to be Rs. 2731.18 per quintal which range from Rs.2671.85 per quintal at marginal farms to Rs. 2721.85 per quintal at large farms. On an overall net income estimated was Rs. 32670.35 per hectare which ranges from Rs. 32305.63 per hectare at marginal farms to

Rs. 34198.05 per hectare at large farms this finding in line with Painkra et al. [4]. Overall family labour income by separating Cost B2 from gross income was Rs.38159.75 per hectare which varies from Rs. 38601.59 per hectare at marginal farms to Rs. 37441.21 per hectare at large farms. It shows that family labour income was higher at marginal farms followed by small, medium and large farms. Overall farm business income was Rs. 52412.47 per hectare ranges from Rs. 52797.74 per hectare at marginal farms to 51741.21 per hectare at large farms. Farm business income was calculated by separating Cost A1 from gross income which was higher at marginal farms as their Cost A1 was minimum followed by small ,medium and large farms respectively. Overall farm investment income was found to be Rs. 46923.08 per hectare. The overall price received per quintal for groundnut was observed to be Rs. 5000 per hectare. Overall net return per rupee or input ratio for groundnut crop was 1:1.82 which ranges from 1:1.88 at marginal farms, 1:1.82 at small farms, 1:1.76 at medium farms and 1:1.76 at large

farms also found that the Kshama [10]. Input-output ratio was found maximum in case of marginal farms followed by small, medium and large farms. It is due to fact that increased productivity on marginal to large farms was result of extra cost incurred which decreased the input output ratio. Secondly, family labour do work more efficiently on the farms and marginal farmers were using more family labour as compared to hired labour where as contribution of family labour found decreasing with the increase in farm, size.

4.4 Income over Different Cost at Sample Farms

The income over different costs was also worked out Table 4. The overall per hectare income over CostA1, CostA2, CostB1, CostB2, CostC1, CostC2 and CostC3 calculated was Rs. 52412.47 Rs. 52412.47, Rs. 52159.75, Rs. 38159.75, Rs. 44739.32, Rs. 32670.35 and Rs. 28691.28 respectively. Income over cost C2 was highest in case of large farmers Rs. 34198.05 similarly found that Raut et al. [7].

Table 3. Yield, cost and return of groundnut on the sample farm (Qt/ha & Rs./ha)

Particulars	Marginal		Small		Medium		Large		Overall	
	Qt/ha	Rs/ha	Qt/ha	Rs/ha	Qt/ha	Rs/ha	Qt/ha	Rs/ha	Qt/ha	Rs/ha
Main yield	13.70	5000	14.33	5000	14.95	5000	15.75	5000	14.68	5000
Price of main product	68500		71650		74750		78750		73400	
By- product yield	8.2		8.89		10.23		8.9		9	
Price of by product	410		266.70		204.60		222.50		281.25	
Gross-income	68910		71916.70		74954.60		78972.50		72461.13	
Cost of cultivation	36604.37		39543.47		42255.51		44774.45		39790.78	
Net income	32305.63		32373.23		32699.09		34198.05		32670.35	
Cost of production(Rs/qt)	2671.85		2759.49		2798.38		2721.85		2731.18	
Family labour income	38601.59		38279.68		37719.22		37441.90		38159.75	
Farm business	52797.74		52547.00		52017.90		51741.21		52412.47	
Farm investment	46501.78		46640.55		46996.90		48497.36		46923.08	
Input output ratio	1:1.88		1:1.82		1:1.76		1:1.76		1:1.82	

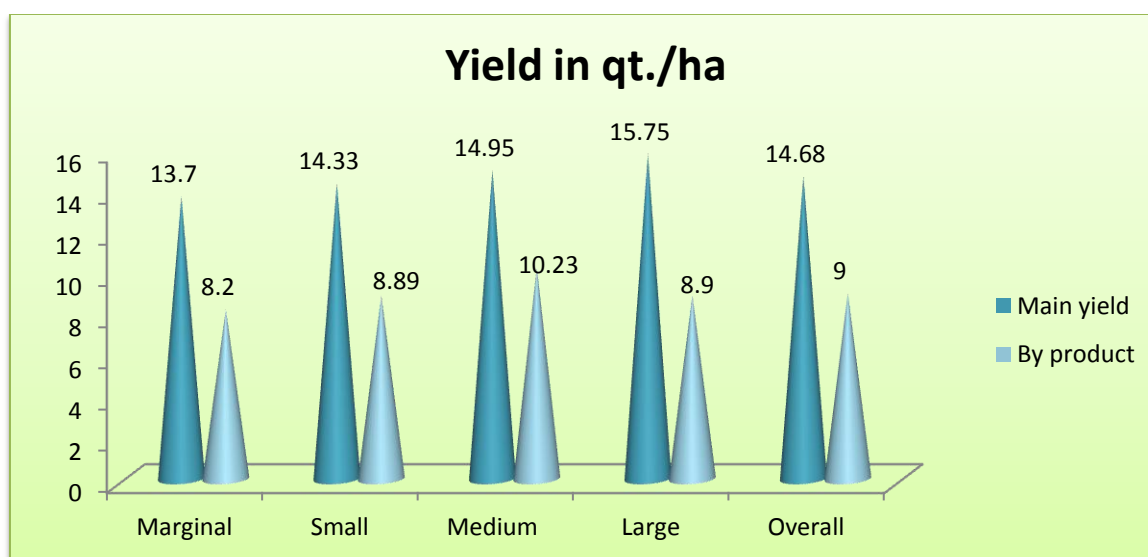


Fig. 2. Yield of groundnut at sample farms

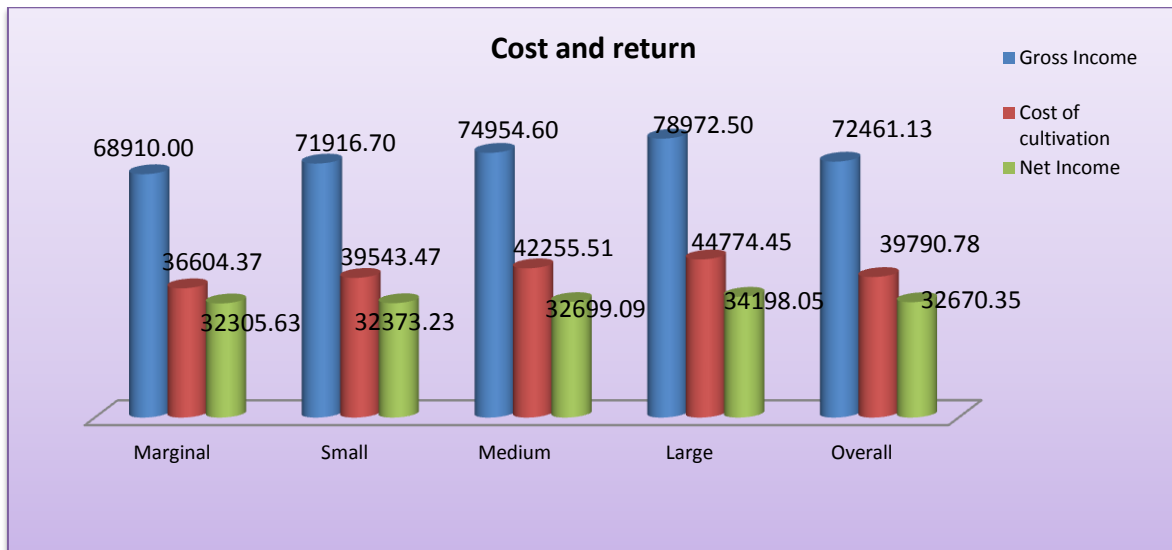


Fig. 3. Cost and return of groundnut at sample farms

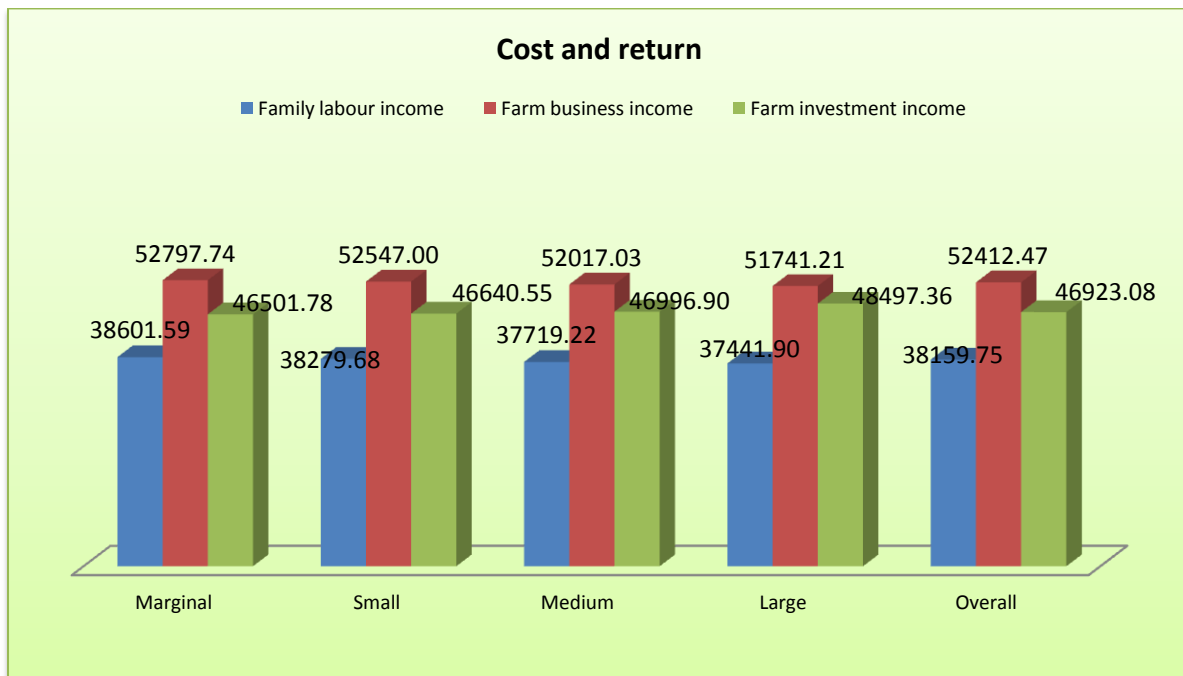


Fig. 4. Cost and return of groundnut at sample farms

Table 4. Income over different cost at sample farms

S.N.	Cost	Marginal	Small	Medium	Large	Overall
1	Cost A1	52797.74	52547.00	52017.03	51741.21	52412.47
2	Cost A2	52797.74	52547.00	52017.03	51741.21	52412.47
3	Cost B2	52601.59	52279.68	51719.22	51441.90	52159.75
4	Cost B2	38601.59	38279.68	37719.22	37441.90	38159.75
5	Cost C1	46305.63	46373.23	46699.09	34198.05	44739.32
6	Cost C2	32305.63	32373.23	32699.09	34198.05	32670.35
7	Cost C3	28645.19	24418.88	28473.54	29720.61	28691.28

5. CONCLUSION

The result revealed that cost of cultivation of groundnut was highest on large farmer followed by medium, small and lowest on the marginal size farm, large farmers has the highest expenditure incurred on human labour and seed while the large farmer has highest expenditure on machinery labour, fertilizer and plant protection chemical. The overall Input-output ratio of groundnut was 1:1.82. Time of survey it observed labour is a major factor of production for the cultivation of groundnut crop and to fulfill it some specify policy such as employment of MGNREGA labors during the peak period of crop production and small scale intervention mechanization for groundnut cultivation should be encourage by government.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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