STUDY ON COST OF CULTIVATION AND ECONOMIC RETURNS FROM CHILLI CROP GROWING DISTRICTS OF TELANGANA

ABSTRACT

Study was done to work out the cost of cultivation, returns and benefit cost ratio of chilli crop growing districts of Telangana. India is one among the world's largest producer, most of the consumption takes place within the country and it is the best exporter of chilli throughout the world. The study is based on primary data and the total number of 120 farmers treated as respondents and had been selected from all four categories of farmers by adopting proportion allocation with simple random sampling without replacement method with the objective of cost of cultivation and economic return from chilli grower B:C ratio of chilli in the study area. In this the study says that the overall average total cost of cultivation is Rs. 328225.25 and in which the total labour cost was 106650 Rs.; Total Material Cost was Rs. 69962; Total fixed cost was Rs. 148975.75 and in which the highest cost is applied to fixed cost and it is to be considered and steps to be taken to reduce the fixed cost. The study reveals that returns in chilli cultivation increases with the increase of the farm size and the overall benefit-cost ratio are 2.41. The average cost, of cultivation per hectare of overall basis, was found to have 147024.50 (costA_1) followed by Rs.150625.25 (costB_1); Rs.29600.2 (costB_2); Rs.182850.25 (cost C_1); Rs. 328225.25 (costC_2); Rs. 361047.78 (CostC_3) has been noted consequently. The average yield was found to be 72.00 quintals per hectare. The overall gross income per hectare was observed to be Rs. 872250.00 per hectare. The B.C ratio was found to be varied in different size of holding and it was maximum 2.52 in large group size accompanied by 2.42 medium group sizes and then by 2.37 small group size next by 2.32 of marginal size group of chilli growers on an average of 2.41 as B.C ratio in chilli production. This implies the B.C ratio increases with the increase in the size of the holding.

KEYWORDS: B: C ratio, Chilli, Cost of cultivation, Production, Returns

In India Chilli is one of the important commercial crops, almost all the states of India were cultivating the chillies. India is one among the world's largest producer, most of the consumption takes place within the country and it is the best exporter of chilli throughout the world after India China, Thailand, Ethiopia and Indonesia. The chillies of India are world-famous for two main reasons one is for their pungency levels and the second one is quality of fruit colour. Indian chilli is exported to many Asian countries they are Vietnam, Bangladesh, Thailand, Sri Lanka and U.A.E. "Naga Jolokia" is a variety of chilli which is considered as world's Number one hottest chilli with the high level of pungency which is grown in Tezpur district of Assam state in India.

The Red chillies are well known for its sharp acidic flavours and colour. Crushing of the dried pods of fruit gives chilli powder. The nutritive value of chilli is excellent, contains vitamins A and C. Green chillies consist of the high amount of proteins, calcium, magnesium, copper and sulphur. Vitamins like Vitamin C, Riboflavin and Thiamine. Chilli is the main key ingredient in different cuisines across the nations for its pungency, flavour and gives colour to the food.

Teja chilli is a fine variety of Guntur chilli. It is the one of the popular variety of chilli in the world and most exported one in the country. It is widely grown in Khammam, Guntur, and Warangal districts of India. The fruit skin of crushed Teja chilli is bright red and hot. It is mainly grown under irrigated as well as rain-fed conditions. In which 90 per cent of the chilli variety grown in this study region is "TEJA". It is one of the hottest chillies in the country with a fiery red colour. It is commonly exported as dried chilli and powdered form. This variety produces

massive yields when mature. The study was been confined to Khammam district. In this district Gross area sown was 2, 23,251ha and Area insured 23846 ha (Kharif) 3864.72 Ha (Agricultural Crops in Rabi) 20484 Trees (Horticultural Crops in Rabi). This investigation was done to work out the cost and returns of chilli cultivation and B:C ratio of chilli in the study area.

MATERIALS AND METHODS: In this reaesrch paper the study was been confined to Khammam district. Multistage random sampling method has been used to select samples. At the first stage of sampling Khammam district of Telangana state was selected purposively because it ranks 1st in the production of chilli. At the second stage of sampling, In Khammam district, there are a total of five agricultural Divisions. They are Palair, Khammam, Madhira, Wyra, Sathupalli. In which Palair division was selected due to the highest area and production under chilli, comparatively more than other four divisions. Palair division has a total of five mandals (Kusumanchi, Mudigonda, Khammam rural, Tirumalayapalem, and Nelakondapally). At the third stage of sampling out of five mandals, Kusumanchi Mandal was selected purposely based on second highest production of chilli and the researcher herself has worked under this Mandal so that the data will be collected more realistic for analysis.At the fourth stage of sampling, from the selected Mandals list of chilli cultivated villages has been prepared. And from this list, five villages were randomly selected with simple random sampling and they are Nelapatla, Loukyathanda, Pocharam, Dharmathanda, Gurvayiagudem. At the last stage of sampling, from the selected five villages a separate list of chilli growers was been prepared, and classified into four categories viz, The total number of 120 farmers treated as respondents and had been selected from all four categories of farmers by adopting proportion allocation with simple random sampling without replacement method. The secondary data has collected the particulars of Area, Production and Productivity of chilli district wise, The data was available from 2008-13 and due to the unavailability of the appropriate district-wise data from 2013-19 the analysis of compound growth rate was done for the total area, production, and productivity of Telangana. And the source of the data was the Directorate of economics and statistics, Government of Telangana; Indian Agristat. The data was been collected for the Agricultural year 2019-2020.

Cost concepts:

The cost of cultivation will be used in this study. The cost concepts are given below:

Cost A1: It includes: -

Value of hired human labour,

Value of hired and owned bullock labour,

Value of hired and owned machinery labour,

Value of owned and purchased seed,

Value of fertilizers, manures and chemicals,

Value of insecticide and pesticides,

Expenditure on irrigation,

Land revenue and taxes,

Interest paid on crop loan if taken,

Depreciation on farm assets excluding land,

Interest on working capital,

Miscellaneous expenses.

Cost A2: Cost A_1 + rent paid for leased inland

Cost B1: Cost A_2 + interest on the value of owned fixed capital assets. (excluding land)

Cost B2: Cost B_1 + rental value of owned land

Cost C1: Cost B_1+ imputed value of family labour

Cost C2: Cost B_2 +imputed value of family labour

Cost C3: Cost C_2 + 10 per cent of cost C_2 as managerial cost.

Profitability concepts: These are defined as under: -

Gross income: It is defined as the total value of main product +by product.

Net farm income (NFI) = Gross income – Cost C_3 (total cost)

Family labour income (FLI) = Gross income – Cost B_2

Farm business income (FBI) = Gross income –Cost A_1

B: C ratio (Benefit-cost ratio) = Gross income/ Gross expenses

RESULTS AND DISCUSSION: The cost of chilli cultivation was analyzed by primary data collected from the questioner and the data analyzed through the information given by the chilli cultivators the cost and returns must be calculated to identify aspects where farmer investments are more and overall analysis of the cost incurred in the cultivation aspects.

Land Use Pattern of Chilli Growers:

In Table No.1 exhibits that the landholdings of various farmer groups range with an average of 0.55 to 12.60 ha. On an overall average of 5.40 ha is identified and the total net cultivated area is 95.71 per cent of all the farm groups.

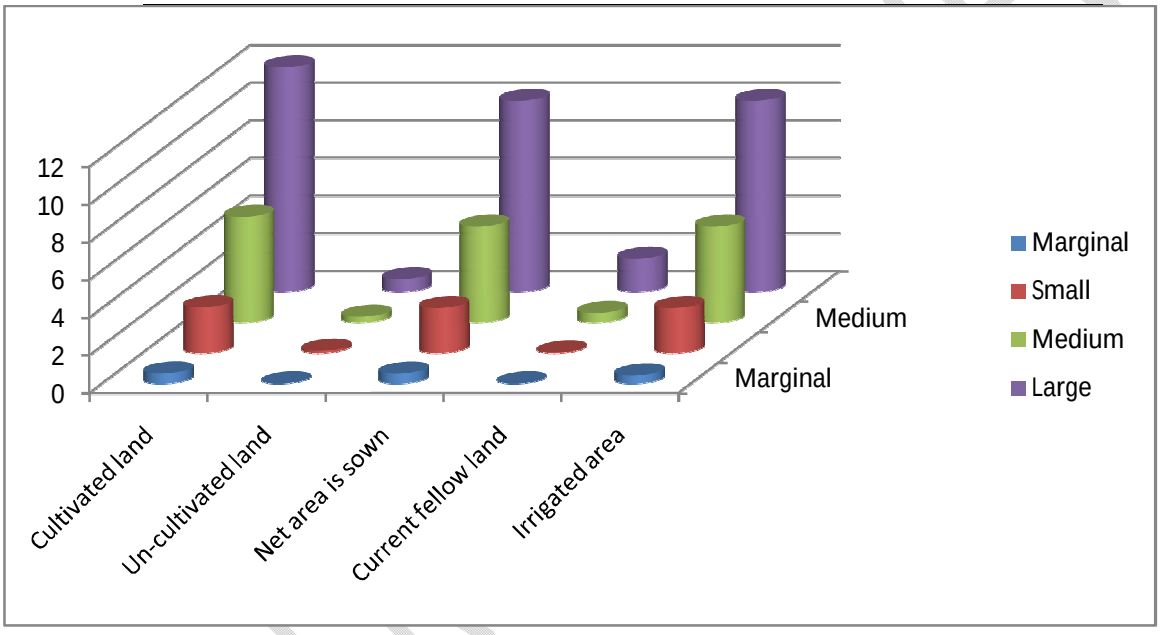
The net sown area was observed 98.18 per cent in marginal; 95.29 per cent in small farm group; 90.91 per cent in medium farm group and 85.15 per cent in a large group of farmers. And the least observed in large farmers and the highest is marginal farmers are noted respectively.

The net irrigated area was 100 per cent in all categories of farmers this is because this belt has a reservoir in the region and mostly 90 per cent through canal irrigation and 10 per cent through the bore and tube well so by this we can say that the region is completely irrigated.

Table No 1 Land Use Pattern of Chilli Growers of different size of farm groups

Particulars	Size of farm				
	Marginal	**Small**	**Medium**	**Large**	**Overall**
Total landholding	0.55	2.55	5.91	12.60	5.40
	(100)	(100)	(100)	(100)	(100)
Cultivated land	0.54	2.43	5.61	11.92	5.13
	(98.18)	(95.29)	(94.76)	(94.6)	(95.71)

Un-cultivated land	0.01 (1.82)	0.12 (4.71)	0.31 (5.24)	0.68 (5.4)	0.28 (4.29)
Net area is sown	0.53 (98.15)	2.39 (98.35)	5.1 (90.91)	10.15 (85.15)	4.54 (88.63)
Current fellow land	0.01 (1.85)	0.04 (1.65)	0.51 (9.09)	1.77 (14.85)	0.58 (11.37)
Irrigated area	0.43 (100)	2.39 (100)	5.1 (100)	10.15 (100)	4.52 (100)



Cost of Cultivation of Chilli

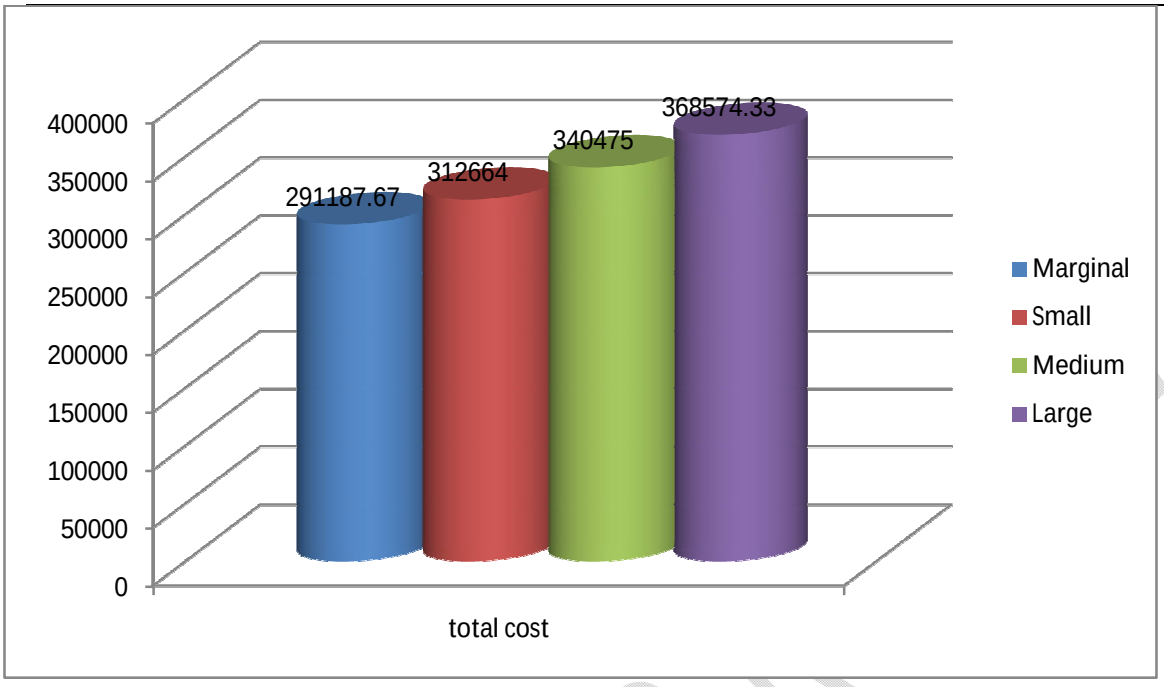
The figures noted in Table No2 disclose that whatever the farm size of farm groups, the total cost of cultivation of chilli of sample farms have been noted on the overall average basis as Rs. 361047.78 per hectare; the total variable cost was 53.81% and the share of labour cost was found to be the topmost is 32.49% accompanied by material cost 21.32%; interest on working capital is 1.55% and the fixed cost is 45.39%. The rental value of land is 44.29% and interest on fixed capital 0.63% and the share of machine power is 4.20% respectively.

Table No.2 Cost of Cultivation of Chilli on different size of farm groups (Rs/ha)

Particulars	**Size of farm**				
	Marginal	**Small**	**Medium**	**Large**	**Overall**
Labour Cost					
Family human labour	51400	39600	22000	15900	37666.67

	(17.65)	(12.67)	(6.46)	(4.31)	(11.48)
Hired human labour	35200	52000	75800	85400	54333.33
	(12.09)	(16.63)	(22.26)	(23.17)	(16.55)
Machine power	13800	14700	15450	15900	14650
	(4.74)	(4.7)	(4.54)	(4.31)	(4.46)
Total labour cost	100400	106300	113250	117200	106650
	(34.48)	(34)	(33.26)	(31.8)	(32.49)
Material cost					
Seed cost	6250	6800	7500	8150	7175
	(2.15)	(2.17)	(2.2)	(2.21)	(2.19)
Fertilizer & Manures	22700	23400	25100	26900	24525
	(7.8)	(7.48)	(7.37)	(7.3)	(7.47)
Plant protection	17050	17850	18750	19250	18225
	(5.86)	(5.71)	(5.51)	(5.22)	(5.55)
Irrigation charges	800	850	925	950	881.25
	(0.27)	(0.27)	(0.27)	(0.26)	(0.27)
Interest on working capital (4%)	4332	5152	6185	6854	5630.7
	(1.49)	(1.5)	(1.65)	(1.69)	(1.55)
Total material cost	63632	67252	72060	76904	69962
	(21.85)	(21.51)	(21.16)	(20.87)	(21.32)
Fixed cost					
Depreciation	1380	1470	1545	1590	1496.25
	(0.47)	(0.47)	(0.45)	(0.43)	(0.46)
Land revenue	30	30	30	31	30.25
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
The Rental value of own land	124041.67	135700	151250	170508.33	145375
	(42.6)	(43.4)	(44.42)	(46.26)	(44.29)
Interest on fixed capital	1704	1912	2340	2341	2074.25
	(0.59)	(0.61)	(0.69)	(0.64)	(0.63)
Total fixed cost	127155.67	139112	155165	174470.33	148975.75
	(43.67)	(44.49)	(45.57)	(47.34)	(45.39)
Total Cost	291187.67	312664	340475	368574.33	328225.25

	(100)	(100)	(100)	(100)	(100)

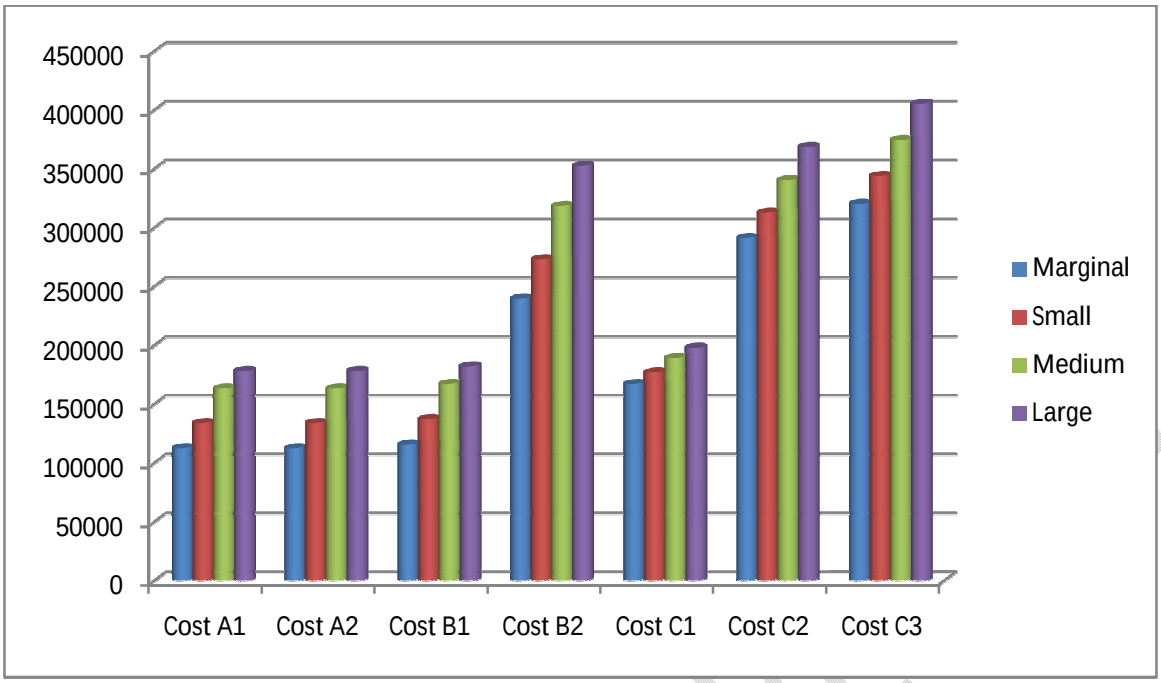


The Aggregate Cost of Chilli Production

From Table No 3 it has been observed that the cost of cultivation of chilli showed that on an average cost, of cultivation per hectare of overall basis was found to have cost A1 147024.50 followed by Rs.150625.25 (costB1), Rs.29600.25 (costB2); Rs.182850.25 (cost C1); Rs. 328225.25 (costC2); Rs. 361047.78 (CostC3) has been noted consequently.

Table No: 3 Aggregate cost of Chilli on Different Size of the Farm Groups. (Rs/ha)

Particulars	Size group				
	Marginal	**Small**	**Medium**	**Large**	**Overall**
Cost A1	112632.00	133952.00	163310.00	178204.00	147024.50
Cost A2	112632.00	133952.00	163310.00	178204.00	147024.50
Cost B1	115746.00	137364.00	167225.00	182166.00	150625.25
Cost B2	239787.67	273064.00	318475.00	352674.33	296000.25
Cost C1	167146.00	176964.00	189225.00	198066.00	182850.25
Cost C2	291187.67	312664.00	340475.00	368574.33	328225.25
Cost C3	320306.43	343930.40	374522.50	405431.77	361047.78



The productivity of chilli:

From Table No 4 it has been observed that the average yield was found to be 72.00 quintal per hectare Data observed that the average yield on different size of holdings was found to be 79.00 quintals per hectare on large size is the highest yield followed by 75.00 quintals per hectare on medium size followed by 69.00 quintals per hectare on small size followed by 65.00 quintals per hectare on the marginal size of land holding.

Table No:.4 Productivity of Chilli on Different Size of Farm Groups (q/ha)

Particulars	Size group				
	Marginal	**Small**	**Medium**	**Large**	**Overall**
The actual main yield(q/ha)	65.00	69.00	75.00	79.00	72.00
Price of the main product (Rs/q)	11450	11800	12100	12950	12075.00
Value of Main Product (Rs)	744250.00	814200.00	907500.00	1023050.00	872250.00

The profitability of chilli cultivation:

Gross income per hectare of chilli production received dissimilitude in different size group. This was due to different quantity of yield per unit crop area and market price received based on the quality and quantity of crop, place of marketing, grading and drying aspects and the time of distributions.

The overall gross income per hectare was observed to be Rs. 872250.00 per hectare. The highest gross return of chilli cultivation was registered by large growers Rs. 1023050.00per

hectare on large size accompanied by medium growers RS. 907500.00 And then by small growers Rs. 814200.00 and later noticed by marginal growers Rs. 7442500.00.

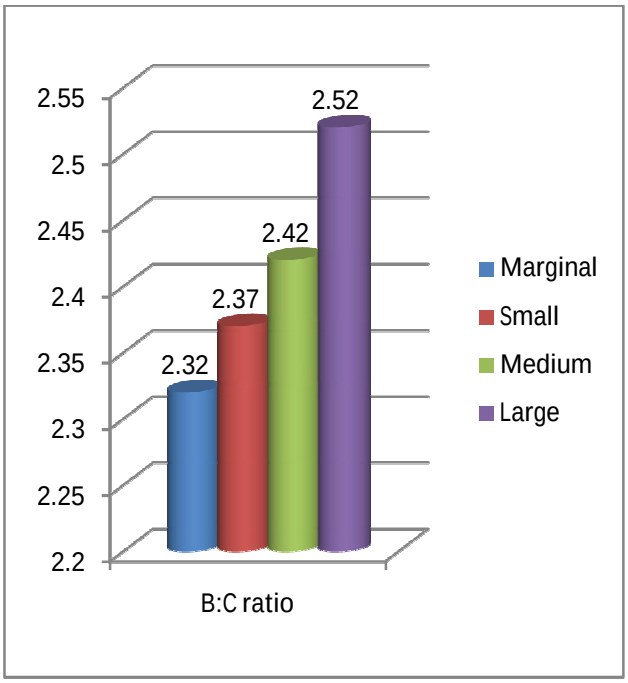
The net income is the real income noted in the chilli growers and it was found to be an average of Rs.511202.23 per hectare. The maximum net return of chilli cultivation was obtained in large group growers Rs. 617618.23 per hectare followed by medium group growers Rs. 532977.50 per hectare accompanied by small group growers Rs.470269.60 per hectare followed by marginal group growers Rs. 423943.57 per hectare.

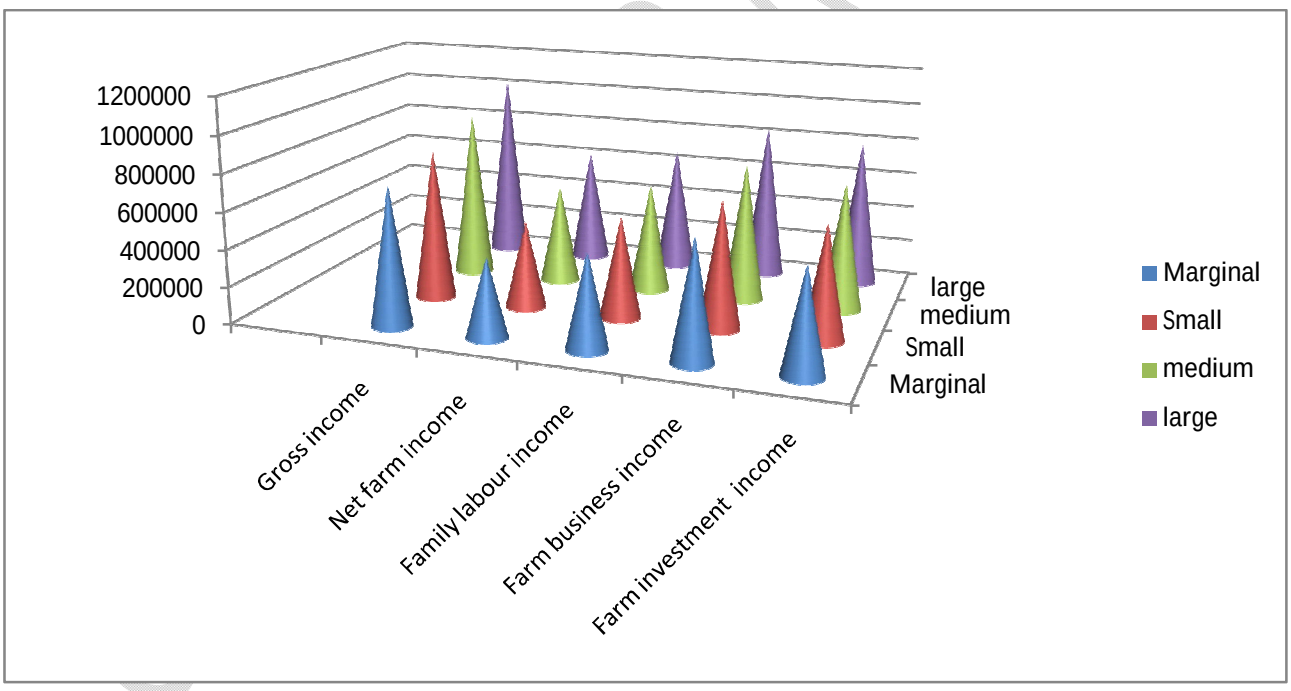
The tendency of net income in chilli cultivation express that it increases with the increase in the size of the farm group. The other profitability measures considered on an average of the chilli growers obtained Rs.576249.75 as family labour income, Rs. 725225.50 as farm business income. The B.C ratio dictates the return per rupee investment. Data shows that the chilli growers realized on an average of 2.41 as B.C ratio in chilli production.

The B.C ratio was found to be varied in different size of holding and it was maximum 2.52 in large group size accompanied by 2.42 medium group sizes and then by 2.37 small sizes group next by 2.32 of marginal size group of chilli growers this implies the B.C ratio increases with the increase in the size of the holding.

Table No: 5 Profitability of chilli on different size of holding (Rs/ha.)

Particulars	Size group				
	Marginal	**Small**	**Medium**	**Large**	**Overall**
Gross income	744250.00	814200.00	907500.00	1023050.00	872250.00
Net farm income	423943.57	470269.60	532977.50	617618.23	511202.23
Family labour income	504462.33	541136.00	589025.00	670375.67	576249.75
Farm business income	631618.00	680248.00	744190.00	844846.00	725225.50
Farm investment income	549689.23	607881.60	686567.50	790467.57	658651.48
Cost of production (Rs./q)	4927.79	4984.50	4993.63	5132.05	5009.49
B.C Ratio	**2.32**	**2.37**	**2.42**	**2.52**	**2.41**





This complete study says that the B:C ratio or return per rupee investment of the chilli growers was determined as 2.41.

CONCLUSION: The study of cost and returns implies nothing but an idea about the amount invested in the cultivation aspects of chilli and this will be using full to identify the areas where farmers have to less their investments and where they can improvise their investment so that by they can gain more profits.

In this the study says that the overall average total cost of cultivation is 328225.25 and in which the Total Labour cost was 106650; Total Material Cost was69962; Total fixed cost was 148975.75 and in which the highest cost is applied to fixed cost and it is to be considered and steps to be taken to reduce the fixed cost.

Similar, Jagtap *et al*. (2012) the overall Aggregate cost of chilli on different size land holdings was Cost A1/A2 147024.50 and cost B1 was 150625.25, cost B2 was 296000.25, cost C1 was 182850.25, cost C2 was 328225.25, cost C3 was361047.78 was found respectively.

The study reveals that returns in chilli cultivation increases with the increase of the farm size and the overall benefit-cost ratio are 2.41. Similar to the present findings were noted in the Gangaiah (2018), Olayiwola (2014).

The total cost of cultivation of chilli of sample farms has been noted on the overall average basis as Rs. 361047.78 per hectare; the total variable cost was 53.81% and the share of labour cost was found to be the topmost is 32.49% accompanied by material cost 21.32% interest on working capital is 1.55% and the fixed cost is 45.39%. The rental value of land is 44.29% and interest on fixed capital 0.63% and the share of machine power is 4.20% respectively.

The average cost, of cultivation per hectare of overall basis, was found to have 147024.50 (costA_1) followed by Rs.150625.25 (costB_1); Rs.29600.25(costB_2); Rs.182850.25(cost C_1); Rs. 328225.25 (costC_2); Rs. 361047.78 (CostC_3) has been noted consequently.

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The overall gross income per hectare was observed to be Rs. 872250.00 per hectare. The highest gross return of chilli cultivation was registered by large growers Rs. 1023050.00 per hectare on large size accompanied by medium growers RS. 907500.00 and then by small growers Rs. 814200.00 and later noticed by marginal growers Rs. 7442500.00.

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REFERENCES:

*Jagtap, P.P.; Shingane, U.S.; and Kulkarni, K.P. (2012).Economics of Chilli production in India.African J. of Basic & Appl. Sci.**4**(5): 161-164.*

*Jorwar, R.M. (2018). Economics of production and marketing of chilli in Amravati district.J. of Pharmacog.and Phytochem. **7**(2): 310-316.*

Kumar, N. and Jain, B.C. (2018).Economic analysis of onion, chilli, coriander production and marketing in Mungeli district of Chhattisgarh.Int. J. of Chem. Stud. ***6****(2): 1361-1367.*

Kumar, P.P.; Singh, N.; Zechariah, J.; Patluri, D. and Vidhya sagar, M. (2018).An economic analysis of production and marketing of dry Chilli in Guntur district of Andhra Pradesh.J. of Pharmacog.and Phytochem. ***7****(3): 2887-2890.*

*Malangmeih, L. and Rahaman, S.M. (2016).Economics of Fresh Naga King Chilli in Manipur, India- A Case Study.Int. J. of Environ., Eco., Family and Urban Stud.(IJEEFUS).****6****(1): 151-162.*

Olayiwola, O.O. (2014).An economic analysis of Chilli crop production in Ilora area of Oyo State.Int. Monthly Refereed J. of Res. in Manag. & Tech.3:47-53.

*Patidar, P.K.; Pandy, P.R.; Gupta, J.K. and Pawaiya, T. (2020).An economic estimation of capsicum production in Shajapur district of Madhya Pradesh, India.Int. J. of Curr.Microbio.and Appl. Sci.****9****(6):1796-1802.*

Narvaria, R. C.S. Ashok, Sahu, M.. Raghuwanshi J.S and Narvaria D (2015)" Profitability in cultivation of Soyabean production in Narmada division of Madhya Pradesh" Ecology, Environment and Conservation Journal EM International 21 (December Suppl.): 2015; pp. (S179-S181) SCOPUS H index 9 Rajur, B.C.; Patil, B.L. and Basavraj (2008).Economics of Chilli production in Karnataka.Karnataka J. of Agricul. Sci. ***21****(2): 237-240*